PROCEEDINGS

1989 MANITOBA BEEF CATTLE SEMINAR JANUARY 17 - 18

89-03323/

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MANITOBA BEEF CATTLE SEMINAR

January 17, 18
Agricultural Extension Centre
Brandon, Manitoba

To producers and industry people, this seminar has become an event which they feel they must attend each year.

The emphasis this year has been placed on realistic and practical considerations in the areas of herd health, facilities, pasture management, and nutrition. Top-notch speakers insure informative and beneficial sessions.

Don't forget the Premier Breeder Awards and the Commercial Displays.

Early registration will insure you a place at one of the highlight events for cattle producers.

BEEF SEMINAR AGENDA
January 17 & 18, 1989

TUESDAY, JANUARY, 1989

Morning Chairperson: Dr. Bob Richmond, Manitoba Agriculture, Winnipeg

8:30 a.m. - 10:00 a.m. – Registration/Coffee – Visit Displays

10:00 – " **'What's Happening' in the Beef Business in Western Canada**" – – Chris Mills

11:00 – **"What Kind of Beef Do We Really Want?"** – A Packer's Viewpoint – Harvey Toews

– **"Can We Produce the Right Kind?"** – A Feeder's Viewpoint – Brian Bouchard

Noon – Lunch

Afternoon Chairperson: Dr. G. Rahnefeld, Agriculture Canada, Brandon

1:00 p.m. – **"Total Beef Management" using a systems approach** – Trevor Jones

2:00 – **Herd Health Management Program Cow-Calf Operators** – Dr. Richard Harlan

3:00 – Coffee – Visit Displays

3:00 – **Cattle Handling Facilities that Work** – Trevor Jones

4:30 – Adjourn

6:00 – Supper – Ag. Centre Dining Room

Evening Chairperson: Norm Hemstad, Manitoba Agriculture, Brandon

7:00 p.m. – **Premier Breeder Awards** – Marni Donetz

7:30 – **"The Weather – What's In Store?"** – Dr. Tim Ball

9:00 – Bull Session in Ag. Centre Recreation Room

WEDNESDAY, JANUARY 18, 1989

Morning Chairperson: Lyle McNichol, Manitoba Agriculture, Dauphin

9:00 a.m. – **Herd Health Management Program for Feedlot Operators** – Dr. Richard Harlan

10:00 – Coffee – Visit Displays

10:30 – "**How Many Fences do you Really Need?**" – **A look at some pasture management systems** – Dr. Don Kirby

Noon – Lunch

Afternoon Chairperson: Lyle McNichol, Manitoba Agriculture, Dauphin

1:00 p.m. – **Forage & Pasture Weed Control – A look at some realistic and economic considerations** – Mark Goodwin

2:00 – **Beef Nutrition using Traditional and Alternative Feed Supplies** – Bill Steeds

3:00 – Adjourn

REGISTRATION FEE – $35.00 ($20.00 daily)

BOARD and ROOM is available at the Ag. Extension Centre

PRESENTATION TO 1989 BEEF CATTLE SEMINAR
IN BRANDON, JANUARY 17TH 1989.

" WHAT'S HAPPENING IN THE BEEF BUSINESS
IN WESTERN CANADA?"

prepared by Chris Mills.

Introduction

I am pleased to have been invited to look at what is happening in the beef business in Western Canada. I assume that the reason that the organizers wanted someone to address this topic was to assist producers who were in the beef business, or contemplating getting into the business, to plan their operations to meet the changing times. I will therefore attempt to adapt my remarks to that end.

I have broken down my presentation into the following broad headings; some comments on the role of the beef industry in the Canadian farm scene; a brief overview of where the industry has been and where we are currently both in the domestic and in the North American picture; an outline of the factors that will influence where the industry goes from here; a look at some of those factors in more detail - in particular the livestock:grain interface, our competitive position in the domestic, North American and international market and the impact of provincial and national policies; and lastly a summary of what I think all these things mean to both individual producers and to policy makers in western Canada.

An Overview of the industry

Key to any understanding of where the beef industry is going in western Canada are two factors - the role of the beef cow in the Canadian farm economy and the positioning of the Prairie beef industry in the North American market.

The beef cow acts as the scavenger of the temperate farm economy. Nowhere is this more evident than in western Canada where cows use land and feed that is unaccessible or useless for other kinds of production. Because of the climate, topography and geography of western Canada we have abundant supplies of such land and feed. However the history of settlement in western Canada has injected another factor - and that is the domination of wheat in our farm policies and structures. This "Wheat is King" philosophy has tended to overshadow and diminish the contribution that the beef industry has been able to make to the western economy.

The other factor - which is now becoming extremely important - is the positioning of our beef industry in relation to the

United States industry and market. There has always been a close relationship and relatively easy interchange of animals, product and technology between our two industry. The relatively unrestricted movement of live animals between here and the US has meant that our prices are basically set by their market. However for a variety of reasons, much of our live animal movement and almost all of the beef trade has been oriented in an east/west direction. This has occurred in spite of the economic forces - which would tend to force most of our trade in both live animals and product into a north/south orientation. As will be pointed out later, the dominant force in the prairie beef industry over the next five to ten years will be the restructuring of our industry into this north-south mode.

Where we have been and where we are going.

In order to position ourselves to discuss changes in the industry, it is useful to consider recent changes that have been going on in the size and distribution of the Canadian beef industry and the causes for them.

The Canadian beef industry is approximately 1/12th of the size of that in the United States and despite short term aberrations caused by drought and our different rate of response to market signals, over the longer term that relationship remains fairly constant.

83% of the beef cow herd and 60% of the feeding industry is located in Western Canada. Although there have not been any dramatic changes in the shares of production between eastern and western Canada over the last several years, there are now clear signs that because of the changing orientation of our markets, that relationship will change and that two semi-independent industries will develop, responding to somewhat different supply signals. At the same time there have been and will continue to be changes in the distribution of the industry within western Canada.

Beef cow numbers in North America cycle over ten year periods. The latest cycle, which started in 1976, was disrupted by a number of factors - in particular the very high interest rates in 1980/81 - but cow numbers appear to have bottomed out in 1987 and there are now some signs, admittedly masked by the drought, that cow numbers in Canada have stared to increase. The United States cycle lags ours by about a year and it is anticipated that their cow numbers will show some increase in 1989. Replacement cattle supplies bottom out during the early stages of the re-building phase of the cycle, when increasing numbers of heifers are retained for breeding.

The prairies are the major surplus producer of feeder cattle, slaughter cattle and beef in Canada. Traditionally

this surplus has been disposed of in the form of the movement of feeder cattle into Ontario and the United States and of beef into the Quebec, Maritime and BC markets. The surplus of slaughter cows and cow beef has gone primarily to the United States.

Latterly, as transport costs have risen, there has been a steady increase in the export of slaughter cattle from the Prairies (primarily Alberta) to packing plants in the US Northwest. This movement has been matched by a decline in the number of feeder cattle being exported from the Prairies to Ontario and by an increase in the importation of US fed beef into eastern Canada and BC.

Factors affecting where the Western beef industry goes from here.

Three important factors will govern what size and kind of beef industry we develop here in western Canada over the next ten years; our ability to access adequate markets; how effectively we exploit our natural comparative advantages in producing for those markets; and the policy and regulatory environment in which we produce and market our product.

The Free Trade Agreement and the developments going on in the GATT mean that over the next ten years we are going to see much improved access for Prairie beef and beef products into the United States and the Pacific Rim. The extent to which we are able to exploit these opportunities will depend on a range of factors - not least of which will be the attitude of Prairie farmers themselves.

From a competitive point of view, over the last hundred years the Prairie industry has proven its ability to compete in the United States market. We have the land, the feed, the cattle and the technical and management expertise. The terms under which we have access to the land and to the feed are vital to our competitive position, and this will be determined to a large extent by the attitudes that Prairie farmers and farm organizations (and consequently Prairie politicians) take to the opportunities that are being opened up to us.

Which brings me to the third area - and that is the policy environment in which we are going to operate. I intend dealing with some of the major policy issues in more detail. However key to the way in which we deal with these issues will be the overall attitude that we have towards change and competitiveness. Our ability to carve out a permanent niche in the United States beef market will requires some major attitudinal and structural changes on the Prairies. A lot of those changes will have to occur within the farm community itself.

The Free Trade Agreement.

Successful exploitation of the recently enacted Free Trade Agreement with the United States is vital to the future of the Prairie beef industry. The agreement allows for the removal of a number of important non tariff and technical barriers that have increased the cost of shipping into the US and have periodicly disrupted our access to their market. These include quotas under our respective beef import laws. meat and plant inspection and animal health procedures and a number of other irritants. While individually these are relatively minor problems, as a whole they have been sufficient to deter any attempts to build up long term and secure markets for beef and its products in the United States.

In addition the agreement does provide for improved procedures for dealing with trade irritants and the opportunity to create more objective procedures for measuring trade distorting procedures.

In fact, while the FTA itself deals with tariff removal, most of the issues that are important to us have to be dealt with in the follow-up procedures allowed for in the Agreement. The way in which we deal with these problems could well have a much bigger impact on our industry than the Agreement itself.

The Grain/Livestock Interface.

As already pointed out, the size and distribution of the Prairie livestock industry has been significantly affected by the history of the Prairie grain industry and especially by the bias of both Provincial and National Governments towards the encouragement of grain production and export.

Three grain related issues will have to be addressed if we are to properly exploit the opportunities for the Prairie beef industry over the next ten years - policies that impact on land use and soil management, grain pricing, and national feed grains policy.

It is now apparent that many of the policies and programs that we have in western Canada have encouraged us to adopt production and management procedures that are not in the interests of good soil conservation. Adjustment of these policies would see reversion of some areas into permanent grass and increased tame grass and other forage production on the prairies. This process will create the base for a significant increase in prairie beef cow numbers.

The Western Grain Transportation Act and a number of lesser policies increase the relative price of grain on the prairies and discourage livestock feeding. While such

policies may have been appropriate for an industry that exported most of its surplus in the form of grain and oilseeds, the opportunities now available to us in the United States make it imperative that these policies be changed.

Similarly the traditional grain marketing systems on the prairies are oriented almost totally towards moving grain to export and tend to treat the local feeding industry as a residual buyer. As we move to export more and more of our grain in the form of value added products like meat, we will have to completely overhaul our feed grain marketing and pricing system.

Getting our subsidy house in order.

Another vitally important issue if we are to become a major exporter of meats and wish to retain secure markets is that of subsidies. The US is very sensitive to the use of trade distorting subsidies on products flowing into their markets. The recent debate over access to the Tripartite Stabilization Agreement has lead us into detailed discussions on relative support levels across Canada. While there now appears to be some agreement on a cap on total Provincial and Federal expenditures in the beef industry, it is still far too high to allow us to feel secure in the US market.

Beyond that it is increasingly apparent that prolonged high levels of Government support become capitalized back into land and other imput costs. They thus become an impediment to future competitiveness. The whole issue of acceptable levels of Government support is likely to lead to growing controversy between those industries and regions dependent on exports and those who are able to dispose of their products within the domestic market.

Processing and Processing facilities.

Key to us getting full value from the opportunities that are opening up for us in the US and Pacific Rim market is the development of a modern and competitive meat packing and processing industry in Western Canada.

The Canadian industry is primarily oriented (both mentally and physically) to serving the domestic market. The growing movement of live slaughter cattle into the US for processing has created serious questions about both the ability and the desire of the Canadian Packing industry to compete in the US market. The building of the Cargill plant in Alberta, linked to a large meat distribution and wholesaling arm in the United States, will put considerable pressure on the Canadian plants in western Canada. It is

likely that one of more of the less efficient plants will close.

Putting it all together.

With the enactment of the Free Trade Agreement with the United States and the possibility of easier access into the Pacific Rim, a new and exciting opportunity is opening up for the Prairie beef industry. Exploitation of that opportunity will depend largely on producers themselves and to a lesser extent on politicians and the political environment that they create.

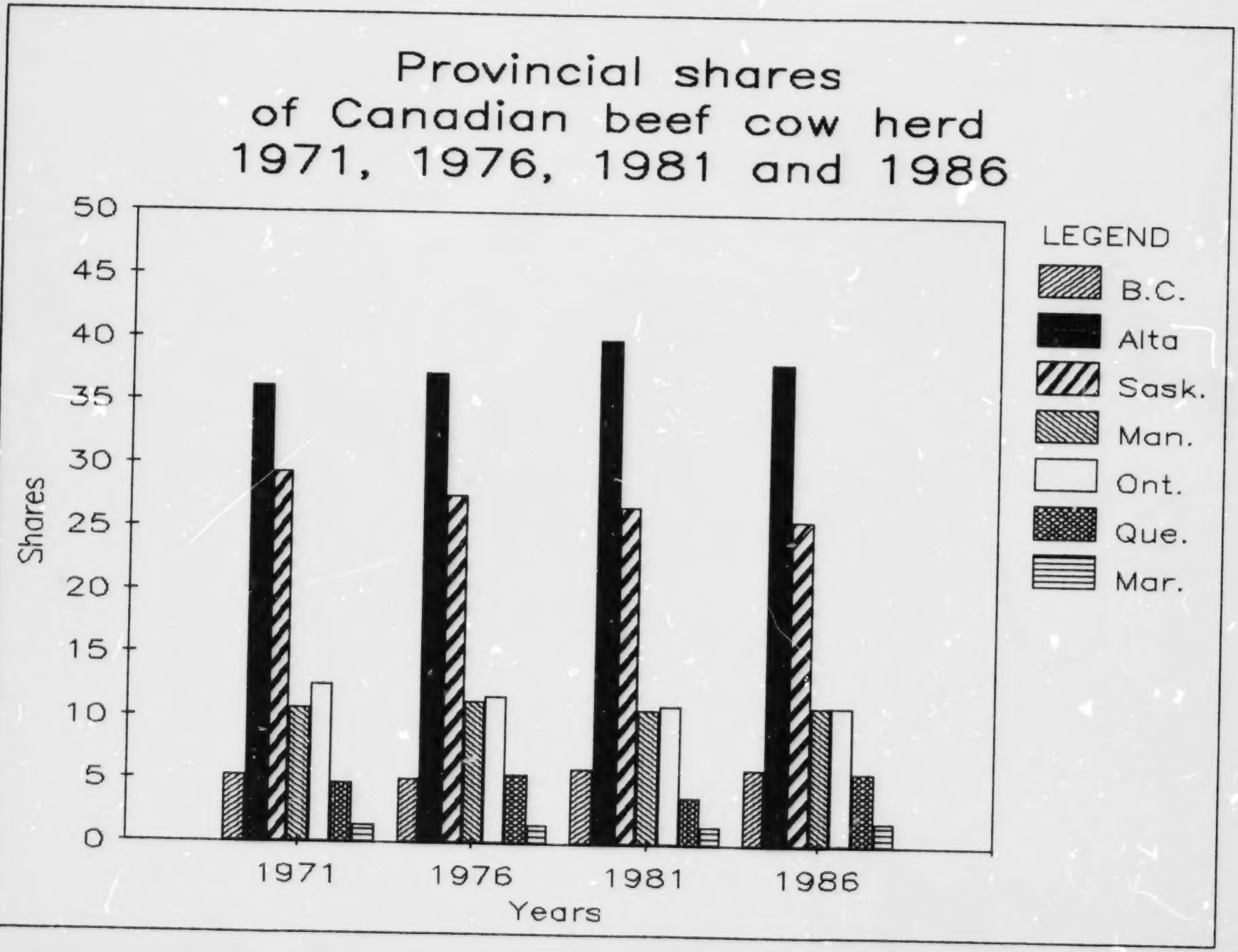
Our ability to increase our sale of beef and beef products to these new markets will depend on increasing our beef cow numbers in western Canada. This increase will not result from any kind of specific price signal - prairie feeder cattle prices are not going to increase significantly relative to those elsewhere. The increase in cow numbers at the individual and prairie-wide level will only come about as the result of increased grazing and other suitable low cost feed supplies. Any significant increase in cow numbers can only occur within the farming areas. The increased feed supplies will have to result from the conscious decision of farmers to change their land and soil management practices - partly in response to changes in provincial and federal policies.

Once we have increased supplies of feeder cattle, their utilization in a western feeding industry will depend on two things - changes to federal policies that presently discourage local consumption of grain on the prairies, and access to an aggressive and competitive meat packing industry - either here or just across the line in the United States.

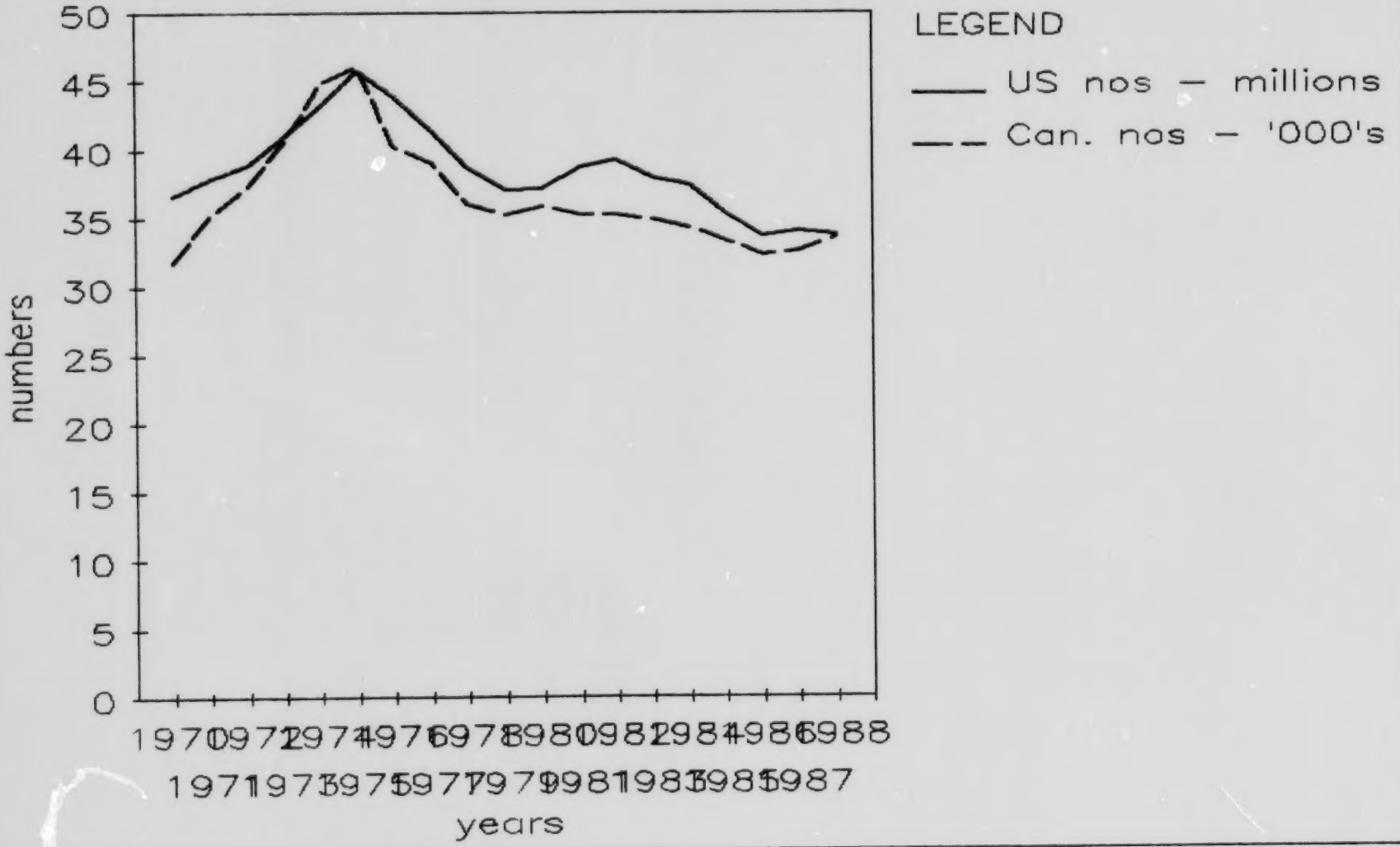
It is my view that the current outlook for international grain prices would suggest that many prairie farmers should be seriously considering restructuring their farm operations and that expansion or initiation of a beef cow or beef feeding operation should be high on their list of options. However in conjunction with any shift in production practices at the farm level we are going to need a major re-think of farm policies and marketing and other structures on the Prairies. It will be interesting to see whether we can rise to the challenge.

I have tried to give you my perspective on what is happening and what is going to happen to the Prairie beef cattle industry. Thank you for the opportunity.

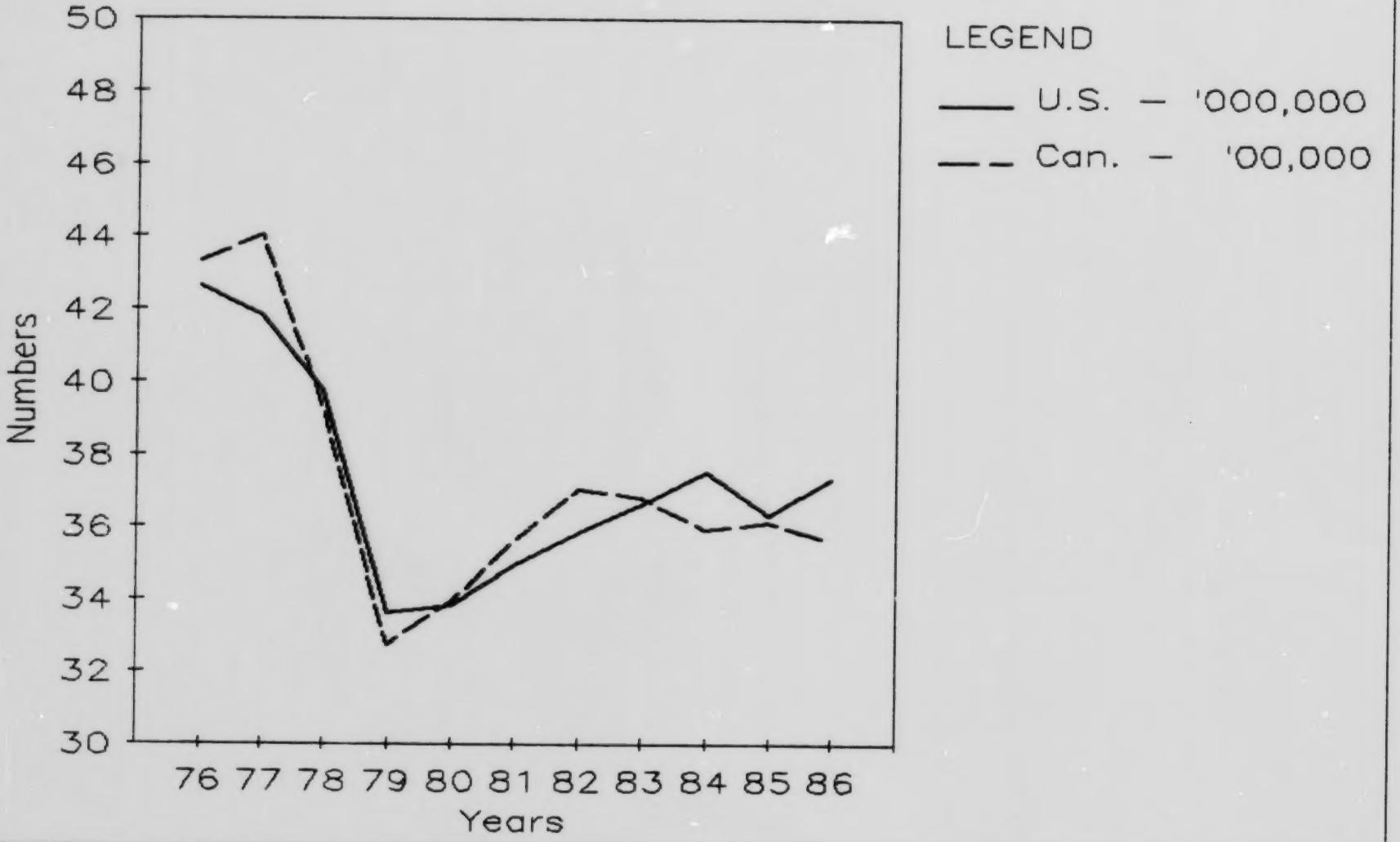
17th January, 1988.


Provincial shares
of Canadian beef cow herd
1971, 1976, 1981 and 1986
50
45
40
35
30
25
20
15
10
5
0
Shares
1971
1976
1981
1986
Years
LEGEND
B.C.
Alta
Sask.
Man.
Ont.
Que.
Mar.

A comparison of Canadian and US beef cow numbers 1970 – 1988



Annual Slaughter Cattle Numbers
Canada and the U.S.
1976 — 1986



FROM PACKINGHOUSE TO CONSUMER

presented by Peter Gall
Best Brand Meats

Mr. Chairman, fellow panel members, ladies and gentlemen, my overview will cover "From Packinghouse to Consumer."

Many of us speak of a 'Beef Industry' which I believe is wrong. I feel we should be addressing ourselves at all times to a 'Beef System,' that is to say, taking the animal from producer to consumer. Each 'Industry' has a vital role to play in the entire "Beef Marketing System." We must consider ourselves a chain, as strong as its weakest link, which presently, in the opinion of many, is the lack of feedlots in Manitoba.

We, as consumers in Manitoba and Canada, can purchase our 'beef protein' needs from two major supply groups - Retail and Food Service.

To be more specific, a few in Manitoba are:

RETAIL:

1) Canada Safeway
2) Superstores
3) Codville - I.G.A.'s
4) Merchants Consolidated - Family Fare
5) Co-Op Stores
6) A variety of Independents that are supported by wholesale houses such as:

1) Codvilles
2) Merchants Consolidated
3) McDonalds Grocers
4) Western Grocers

FOOD SERVICE:

1) Fast food through McDonalds, Burger King, Wendy's, Dairy Queen, A&W, etc.
2) White table cloth restaurants such as Hy's Steak House, The Keg, Rae & Jerry's, etc.

As Beef Producers, have you ever been fully aware of the other "Beef Industry?" That's the one which takes a live animal to a dressed carcass, roast, steak or a hamburger patty.

The Meat Packing Industry is a service industry, with fixed assets that are considered for a one-purpose use. Unlike the garment industry, sewing machines can be moved from one warehouse to another, or from one province to another. Meat Packing plants today are highly sophisticated labour intensive operations. To exist and have a chance to operate profitably, they are totally dependent on a continuing daily supply of cattle, raised specifically for their customer mix. Numbers alone, are not the answer.

At the present time, intermediate packers such as Best Brand Meats, Burns - Brandon, and East West Packers must reach into Saskatchewan and Alberta for a good part of their supply on a weekly basis. These plants slaughter a mixture of steers, heifers and cows. The fortunate part of a slaughtering facility is that depending upon market conditions, it could survive on killing cows only, and not have to kill a steer or heifer. However, in Manitoba, a mixed kill is a must to maintain throughput pounds to offset total production costs and fixed overheads.

Manitoba slaughter plants, like most Western plants, are export plants, therefore, they are dependent on beef settlement prices in Ontario and Quebec, as well as the yellow sheet from the United States. Many times these prices, either good or bad, are not reflected in the same week as cattle were purchased. Cattle can be dressed and shipped before the Montreal Settlement price is finalized.

A western slaughter facility will ship dressed carcasses or quarters directly to stores in Manitoba or to breakers, as well as central retail processing plants in Alberta and Eastern Canada.

In Manitoba, Canada Safeway must support its Calgary central cutting plant, known as Lucerne Foods Ltd., whereas the Superstore purchases dressed cattle on a carload basis, either from Alberta packing plants or local, depending on price.

Some customers in Eastern Canada are:

1) Steinbergs & Trillium Meats in Toronto which purchase dressed carcasses or quarters.
2) Loblaws, I.G.A., and A. & P. purchase Block Ready Beef, with warehouse shipments, or to retail stores as required.
3) In Montreal, some wholesales still exist that purchase dressed carcasses and supply smaller retail outlets, whereas the large players, such as Boeuf Merit, Provigio, and Boni Prix, have central cutting areas or warehouses set up to handle Block Ready.
4) Breaking plants in Ontario purchase dressed carcasses or quarters and vacuum pack beef into retail and food service cuts. Best Western Meats in Toronto custom pack under private label for many food service suppliers. As a fabricator located in Toronto, this company can also purchase American or roll beef to complement their supply or to offset Canadian prices.

Consumer dollars spent on food requirements are broken down as - approximately 66% at retail outlets and 34% at Food Service establishments.

In Eastern Canada, retailers share a market and do not dominate, such as in Manitoba, where Canada Safeway Ltd. and Superstores are major players.

When markets are shared everyone tries to sell at a profit (value added).

However, when two giants try to out-position each other, the above does not always hold true. A good example is the price of regular ground beef in Manitoba, which has been selling at levels of 68 to 78¢ per pound for many months.

If you tried to purchase boneless beef 85% chemical lean for June arrival on today's market, you would have to pay $1.41

per pound, F.O.B. Vancouver, Halifax, Montreal, or Toronto ports of entry. The same product, cleared and delivered to Manitoba would cost an additional 7¢ per pound.

Manufacturing plants that supply McDonalds hamburgers have a current settlement price:

- Boneless Beef 85% lean $ 1.43/pound
- Boneless Beef Trim 60% lean .73/pound

As you can see there is quite a difference in marketing philosophies.

Food service suppliers, more commonly known as purveyors, specialize in middle meat cuts from choice cattle, slaughtered either in Canada or in the United States.

Middle Meats are defined as rib or loin cuts, or to be specific, in Manitoba:

- A deluxe or gourmet 1109 AR rib 1x2 trim 12/16 pounds A2-A3 Canadian quality or choice no roll
- A boneless beef 1180 striploin 0x1 trim 8-10 pounds
- A boneless beef 1184 sirloin top butt 8-10 pounds
- A boneless beef 1190 tenderloin 3-5 pounds

The only hip or chuck cuts that a purveyor would handle would be, respectively:

- A boneless beef 168 Inside Round
- A boneless beef 116A shoulder clod or chuck roast

Food Service, unlike Retail Stores, do not like to contract prices on a weekly basis, as their menus are prepriced and expensive to change. They prefer monthly or six month seasonal fixed prices.

This now opens the door to Australia, New Zealand and Nicaragua to supply boneless beef or hamburger patties, and the U.S.A. for no roll middle meat cuts.

Meat purveyors can now guarantee supply and price to pass on to their customers. A container of boneless beef will hold 36,000 pounds or 660-60 pound cartons. A 40,000 pound truck load from the U.S.A. will hold approximately 4,000 striploin, top butts or 8,000 tenderloins, or 2,000 deluxe ribs.

In Canada there are at least 8-10 major players that could be on the market at one time purchasing boneless beef, boneless trim and middle meat cuts. Canadian meat packers could never supply the cattle at any given time to satisfy these demands.

However, if we were to follow the Chicken Industry that over the years genetically breed and scientifically raised a chicken to suit the 9 piece Kentucky Frid Chicken program, then perhaps we could satisfy our consumer needs and demands for beef sold at Retail and Food Service Outlets.

A suggestion as to what that animal would consist of for Manitoba:

- 2 A1 Chucks 60-70 lbs. each
- 4 A2-3 Ribs 25-30 lbs. each
- 2 A1 Hips 60-70 lbs. each
- 6 A2A3 Striploins 8-10 lbs. each
- 6 A2A3 Top Butts 8-10 lbs. each
- 8 A2A3 Tenderloins 4-6 lbs. each

In conclusion, as you can see, we have a serious problem in the "Beef System" to supply all our demands as consumers. Perhaps with ongoing dialogue involving all industry parts of the system, we will understand what is taking place in the market and we can address the problem as one voice.

Thank you for the opportunity of sharing some of my experiences with you.

Presentation to 1989 MANITOBA BEEF CATTLE
SEMINAR in Brandon, MB
January 17, 1989

prepared by Brian Bouchard

"Can We Produce The Right Kind?" is a question that we, as producers, have to ask ourselves everyday.

First of all, let's discuss this question in regards to the cow-calf operator. As more and more producers switch to some form of cross-breeding program, we see greater fluctuations in the prices paid for various calves; not so much as to the individual breeds but more the quality within these various crosses. While I was manager at Carberry Feeders, we preferred to purchase cross-bred calves with virtually no discrimination against any colour or breed. With our high energy ration, we needed calves with stretch and scale still possessing enough easy fleshing ability to get fat and grade at a desirable weight.

These kinds of calves were readily available in large numbers from our Manitoba producers, and I might say, demanded a premium. What about the ones that didn't demand a premium? It is possible, if you can't manage your herd at present, that buying a bull of another breed could compound your problem. If you continue with your present program, you may not see a lot of improvement but your program won't deteriorate substantially in one year either. If you add a bull of a second breed you should know what your goals are. Some of these possible goals could be heavier weaning weights, more dollars per calf weaned, replacement females, or various other reasons. When you have placed these in your particular order of preference, you then can decide on the direction your crossbreeding program will take.

This may sound simple enough, but let me throw another curve at you. Some of the best cattle we fed were three-way cross calves. They were big, heavy calves at weaning and possessed the ability to gain and, consequently, go on and be extremely desirable car-

casses at slaughter. This may also be something to consider when you make that first cross breeding decision. Bear in mind that you must leave some flexibility in your decisions to allow for changes in market trends.

Here in Manitoba, our calves vary greatly. The better end will continue to improve because they are in the hands of some of the best cattlemen in North America. The bottom end is where the dramatic changes need to be made. In a lot of cases these producers' costs are just as high as those incurred by the owner of the premium calves. It is only a matter of time before the bottom quality producers will succumb to the cost price squeeze or have to address the product he is producing for the market place. Producers in this category have ample time to make changes for the 1989 breeding season. Unfortunately, in the ccw-calf business today, decision is eighteen months from the bank. It takes a lot of foresight and advanced planning to be successful.

Before we leave the topic of cow-calf producer, there are a couple of problem areas I feel we need to address. One is the number of calves going to market with the horns still on. At Carberry Feeders, the calves being fed to slaughter were able to be handled with the horns on, but a number of feedlots find cattle with horns a problem. If you are back grounding cattle, you certainly need to dehorn them for resale. Let's face it - you simply eliminate some of the buyers by not having your calves dehorned. If you are attempting to top the market on a given day, you need every potential buyer available. From a cost viewpoint, the setback if a calf is dehorned at birth is minimal but can be fairly stressful if done after arriving at the feedlot. Many buyers feel $10 per head horn penalty would not be out of line. Personally, I feel $1 per horn penalty, similar to Saskatchewan, would provide the incentive and the proceeds could help fund various livestock projects.

The second area, that is the practice of not castrating male calves, has a few more pros and cons. Although some research has been done on the feeding of virgin bulls, I feel no conclusion has been made on this practice. A few isolated pens could quite possibly work, and work well, but I would have a hard time looking forward to feeding 6,000 virgin bulls in pens of 100 to 200 head. The question you must ask yourself as a producer is - "Can I afford to eliminate all those buyers whose orders are for steer calves?" It is not uncommon on a given day at an auction mart to see six or eight buyers bid on the top end of the steer calves, and only two or three bidders on similar bull calves. Until this practice is more readily acceptable, you take quite a chance presenting your male feeder calves as bulls. In many cases one would have to ask: "Are virgin bulls a management decision or a product of mismanagement?"

When it comes to producing 'the right kind of fat cattle', you get into a whole different world. The packers seem to possess the amazing ability to require 1150 or 1250 lb. fats when your fats are weighing 1050 to 1100 lbs. Then when you get a few carcasses weighing in the 1250 to 1300 lb. range, they can't use anything over 1200 lbs. In fairness to the packers, they are probably responding to the demand for their product, as well.

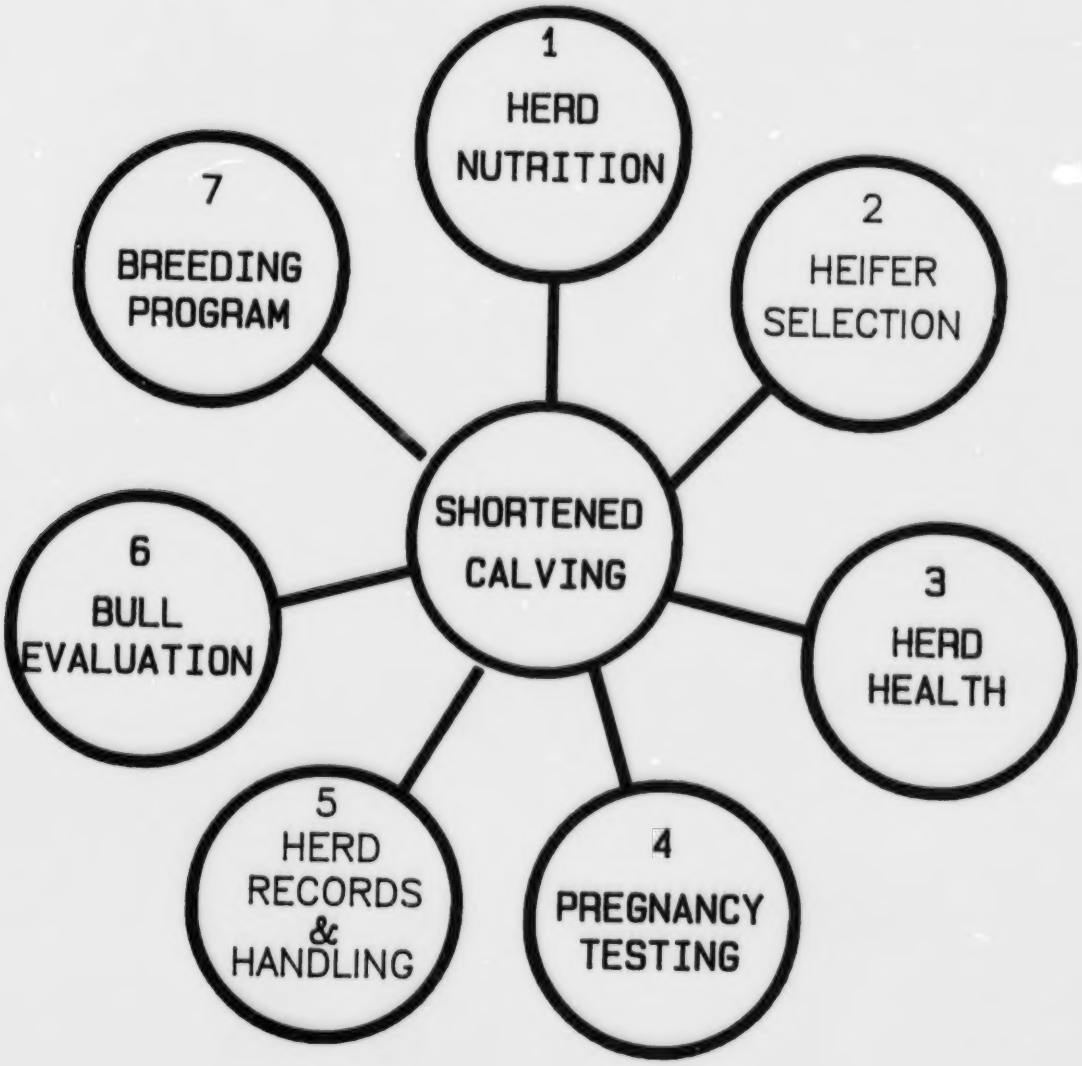
At Carberry Feeders, during a period from July 1, 1988 to October 31, 1988, I shipped cattle to twelve different plants. At first, this may seem a little unnecessary and impractical to you, but think about it for a minute. Why not ship the various categories of fat cattle to the plants that demand and best utilize those particular carcasses. For example, we have plants in Manitoba that prefer 1050 to 1100 lb. A cattle. On the other hand, there are plants in the U.S.A. who like 1300 lb. 'choice' cattle, a 'choice' being equivalent to something like an A3 or A4 in Canada. If you follow this through, you can see how we were expanding our options, thus eliminating the need to sell in any given week regardless of price, or to ship an undesirable product to a particular plant, which in turn would be discounted heavily. If you

decide to continue on and feed A's for the U.S. market, feeding another 45 to 60 days should give you a good percentage of choice grade animals.

In conclusion, I feel very strongly that we can produce the 'right kind' of both feeders and fat cattle here in Manitoba. But always remember, the competition continues to improve and so must we, to stay competitive.

TOTAL BEEF PRODUCTION

(A SYSTEMS APPROACH)



TOTAL BEEF MANAGEMENT
(A Systems Approach)

Trevor Jones
Regional Livestock Specialist
Alberta Agriculture

There are few things that a cattleman can do that will return more money from his herd and reduce the annual labour output, than shortening the calving period. This is a goal worthy of every cattleman, and of every extension agent working to help cattlemen.

Maybe some of you wonder what I mean by "shortening" the calving period? Each one of you are aware of the length of time that elapsed between the birth of the first and last calf in your herd in 1987. Was it 60 days? 100 days? 150 days? 200 days? Or more? Some vets tell me they know of some herds that have a 365 day calving period. I'm referring to a short calving period in which 75-85% of the cows and heifers calve in the first (heat) period of 21 days, 15 to 25% calve in the second 21 day period, and maybe 5% of the cows calve in the third 21 day period of calving. This means that calving constitutes a total of about 28 days for first calf heifers, and 48 days for cows.

I've said the increased income from a shortened calving period will represent faster returns than anything else that you can do with your herd in the same length of time. The following example illustrates this point.

COMPARATIVE REVENUE FROM 100 CALVES
BORN DURING TWO DIFFERENT CALVING TIMES

Calving Time A

Calving Period (each 21 days)	1	2	3	4	5	6	7
% Calves Born	14	15	14	14	14	15	14
*Weaned Weight	7070	6945	5894	5306	4718	4425	3542

Total weaned weight = 37900 lbs of calves. Total days calving = 147.

Calving Time B		
Calving Period	1	2
% Calves Born	75	25
Weaned Weight	37875	11575

Total weaned weight = 49450 lbs of calves.

Total days calving = 42.

Increased weight due to a shorter calving period = 11550 lbs.

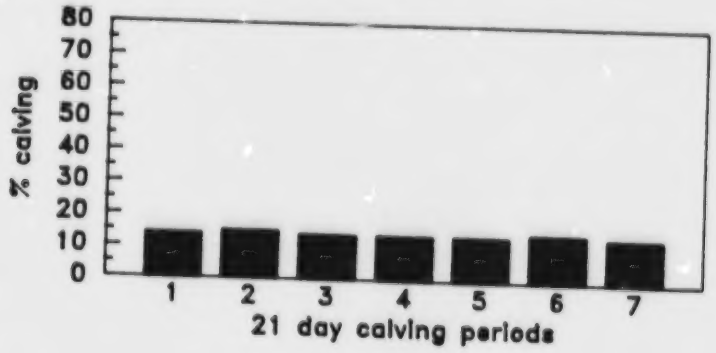
*a) First calving for both examples was March 1.

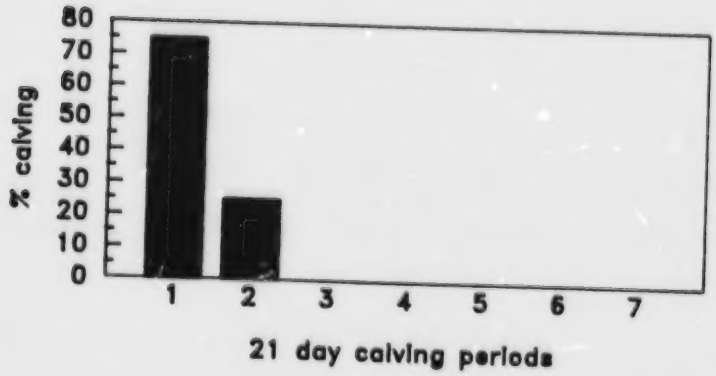
b) Average birth weight is 85 lbs.

c) Average gain/day for nursing calves is 2 lbs.

d) Weaning occurred October 7 (220 days after first calf born).

Calving profiles are a means of graphically illustrating the results of a calving period. The following profiles illustrate at a glance the sequence cited in the above two examples.





The logo which illustrates the management required to shorten the calving period describes a sequence of events.

1. Cow Herd Nutrition

a) Forage and grain samples should be collected before winter feeding begins.

b) Using a simple balancing sheet, along with the NRC nutritional requirements and feed test results, balance the winter rations for each class of cattle. Particular attention should be paid to pre and post calving cows and heifers.

c) Nutrient deficiencies are anticipated and amounts required may be purchased in bulk or quantity.

d) Vitamin A injections are administered at the most appropriate times required to increase liver stores of Vitamin A.

2. Replacement Heifers Selection and Feeding

a) Heifers that calve early the first time, tend to repeat early calving as cows.

b) Heifers that reach a target of about 60% of mature weight before breeding, will have a much greater chance of conceiving. Heifers should experience two to three estrus periods before bulls are turned in.

c) Properly prepared bulls and heifers should achieve 80%+ conception in the first heat period.

d) By calculating the time (days) from weaning to approximately the first heat period (42-63 days) before breeding, the target weight and daily gains can be calculated. Ration development can then be easily accomplished (see attached ration sheets).

e) Heifer selection for replacements should be done with a view to radical culling before they enter the cow herd.

- Discard outstandingly large top end of heifers.
- Select twice the number required from among early calving dams with high maternal scores (CIP calving record book example).
- Cull a few before breeding based on growth, conformation.
- Cull all open and late pregnancies at preg test time. The usual will be 95-98% pregnant, with about 10% late pregnancies. Develop a marketing strategy for these heifers.
- Strictly record calving information (CIP) and designate high maternal scores for culling as soon as possible.
- Make a final cull at weaning based on the calf (weaning index).

f) Avoid purchasing replacement heifers, your own reflect your diligence in bull selection, breed selection and disease control efforts. Purchased heifers are "unknowns".

3. Herd Health

a) During the late summer, consult with the local vet to draw up an annual herd health program.

- Diseases.
- Product name.
- Date of injections for different classes of cattle within the herd.
- Dates for booster shots.

b) Discuss your herd health program to ensure that updating occurs.

c) Plan the calving flow. A part of every herd health plan is the flow pattern at calving time to reduce scours among late winter and spring calving herds.

- The wintering herd should be spread out, with room to move not only for improved exercise, but reduced contact.
- Move cows from the winter feeding area to a pre-calving area.
- Calving barn or shed with roomy, clean bedded stalls in which to mother-up calves, and ensure colostrum intake. This barn should have a "trouble" stall with headgate to assist calvings, obtain colostrum samples (eg. "clostrodoser", to measure density and hence immune body density of colostrum).
- Small post-calving pens for newborns, calf shelters, and no more than 20 cow-calf pairs together.
- Calved cow area, allowing lots of room, taking groups from post calving pens.
- The calving flow is a one way road, with no return through to the winter feeding area by calved cows.

4. Pregnancy Testing

Preg testing takes on a whole new meaning when used as a tool to shorten the calving period. Properly fed cattle, in conjunction with fertility evaluated bulls, should provide a consistent 94-98% conception of cows and heifers. However each year, some females may conceive later (for any number of reasons) and preg testing will identify these individuals along with the open females. By constant monitoring with annual pregnancy checks, uniformly short calving periods can be maintained year after year.

Some cattlemen "pull the bull" at given times to control the breeding period, and hence the calving period. This is not only inconvenient, but may be costly. It should never be considered during the early years of attempting to shorten the calving time in a herd.

5. Herd Records and Handling Corrals

When attempting to implement the systems approach to herd management, it becomes obvious very early on that good production records and simple handling corrals become vital.

Individual cow I.D. is the best situation, but failing that a simple tally of the number of cows, first calvers and second calvers which calve daily, will provide enough information to complete the calving profiles.

Handling facilities to allow easy and convenient handling of cattle, to complete all the necessary operations is naturally an important part of herd management. It is however often a very neglected part of many operations.

One of the excellent reasons for good records is in tracking down the reasons for "blips" that appear in herd performance.

Once such "blip" is the apparently good cow, that appears open or with a late pregnancy at the preg test. Records may show that previous calvings were early, and her calf weaning weights higher than average. This kind of cow was likely a heavy milker and the level of nutrition could not sustain both heavy milk production and estrus.

Other conditions that may go unnoticed without good records, may be easily tracked down with even simple records.

6. Bull Evaluation

The old saying that "the bull is half the herd" is a bitter truth, half remembered when open cows and heifers, and 150 day calving periods are experienced.

Simply put, bulls must be fertile, physically fit, and willing and able to service cows. Veterinary evaluation for the following is necessary within 30 days of commencing breeding.

a) A semen examination for both sperm motility and sperm formation (morphology).

b) Testicle, scrotal and penis examination.

c) Scrotal measurement to ensure minimum scrotal circumference for age.

d) A physical examination, particularly of eyes and feet.

The final test is one that only the cattlemen can administer, and that is to ensure that the bull can and will breed cows. Vigilance pays off!

If more than one bull is to be used, introduce them to one another at least three weeks before turning them with the cows.

7. Breeding Program

Everyone has his own choice of breeds, and only a purebred breeder could be expected to promote one breed over the other.

When choosing breeds, be sure they are best suited to your conditions. Large frame cattle are probably better adapted to abundant feed and a forage grain combination. Small to medium frame breeds may be best suited to high forage and range conditions.

Crossbreeding is undisputed as a breeding program, and the greatest strength comes from a crossbred cow.

Bull selection should be made so that constant emphasis is made for reproductive efficiency. Bulls must be selected for these traits first.

a) Birth weight. Ease of calving is vital to a fast recovery of the uterus. Choose bulls with average or even below average birth weights. Don't choose the breed for easy calving as much as choosing the bull within the breed for this trait.

b) Dam record. Cows which calve regularly in the early part of calving, with no assists, are the kind of dams from which to choose future herd sires.

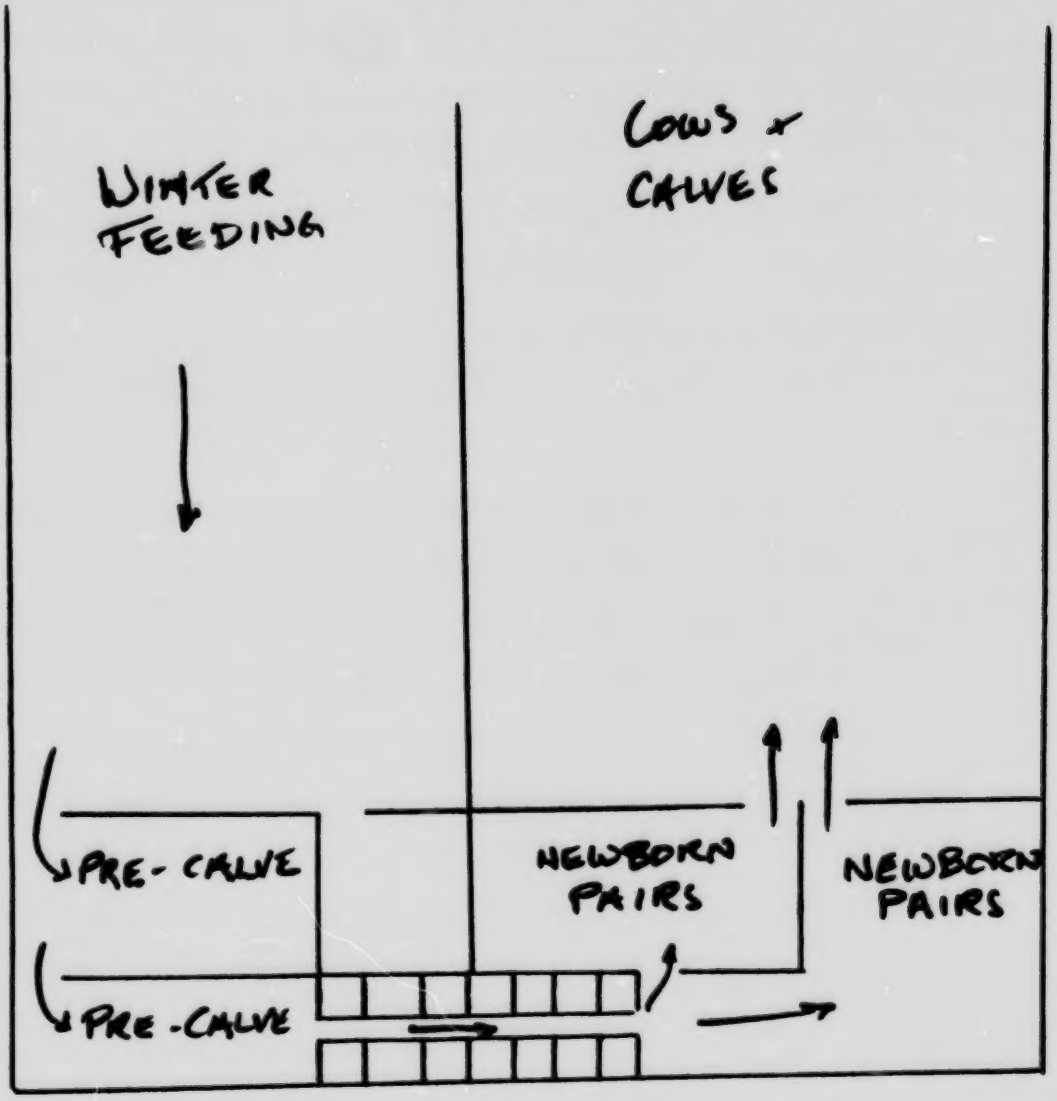
c) Weaning index. Bull calves weaning with above average weight in the herd (above 100 weaning index) should be able to sire daughters which have better than average milking ability.

d) Buy young bulls. Choose bulls before they reach a year of age if possible, and don't be overly impressed by growth records. Avoid buying two year old virgin "fitted" bulls.

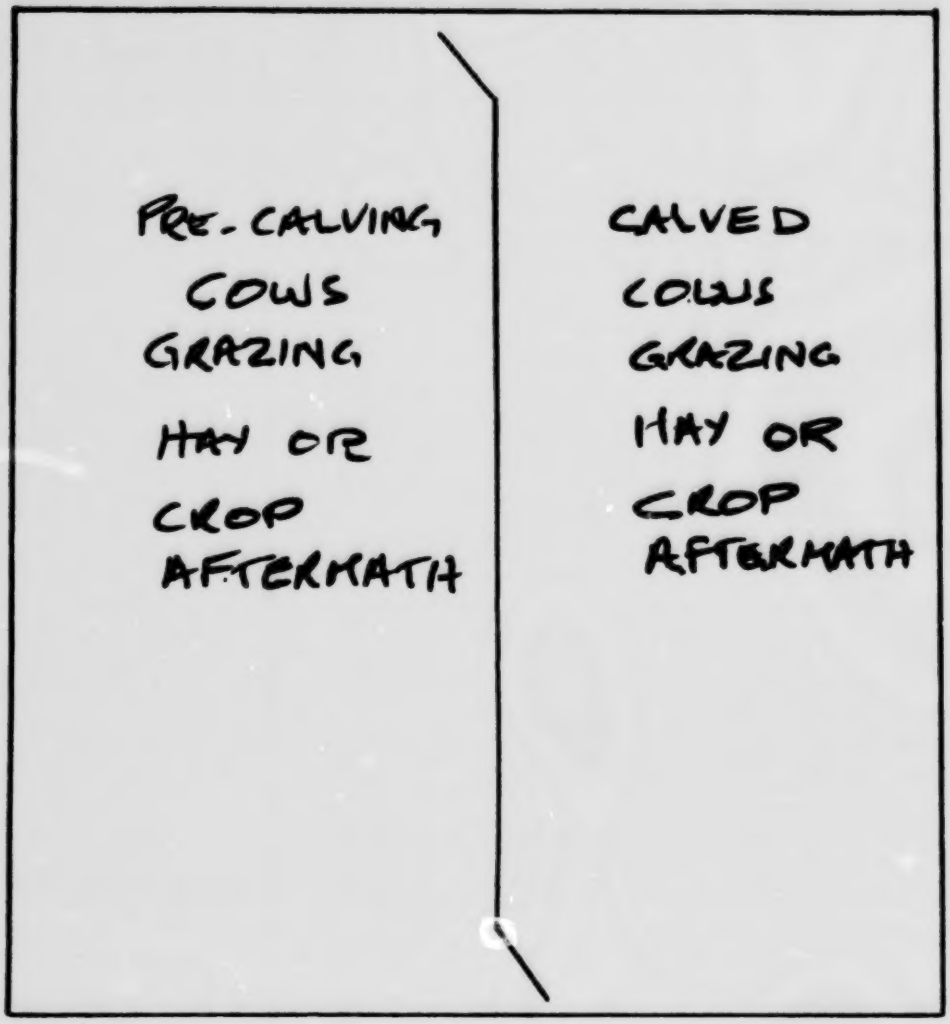
Emphasize reproduction efficiency before either growth or carcass quality.

Those are the seven major management factors which when fine tuned, will accomplish a shorter calving period, and increase herd income. Dramatic progress can be made within the first couple of years. Those who are impatient and wish to speed up the shortening period, will attempt synchronizing or inducing estrus by artificial or natural means.

The goal is a worthy one, and the system is tried and true. Nothing about the seven management points is new or different. Now though, the reasons for the management emphasis are clear, and the success easily measured.



CALVING FLOW PATTERN
WINTER-SPRING CALVING



FALL CALVING FLOW PATTERN

CIP – PEACE COUNTRY CATTLE IMPROVEMENT PROGRAM

RECORD OF THIS COW

OWNER: _____

COW IDENTIFICATION (Ear tags, tattoo, brands, etc.)

Birth Date: _____ Purchase Date: _____

Birth Weight: _____ Purchased From: _____

Calving Period Born In: _____ Purchase Cost: _____

Maternal Score of Dam: _____ Culling Date: _____

Comments: _____ Culling Value: _____ Reason: _____

Weaned Score: _____ Dam Breed Code and ID: _____

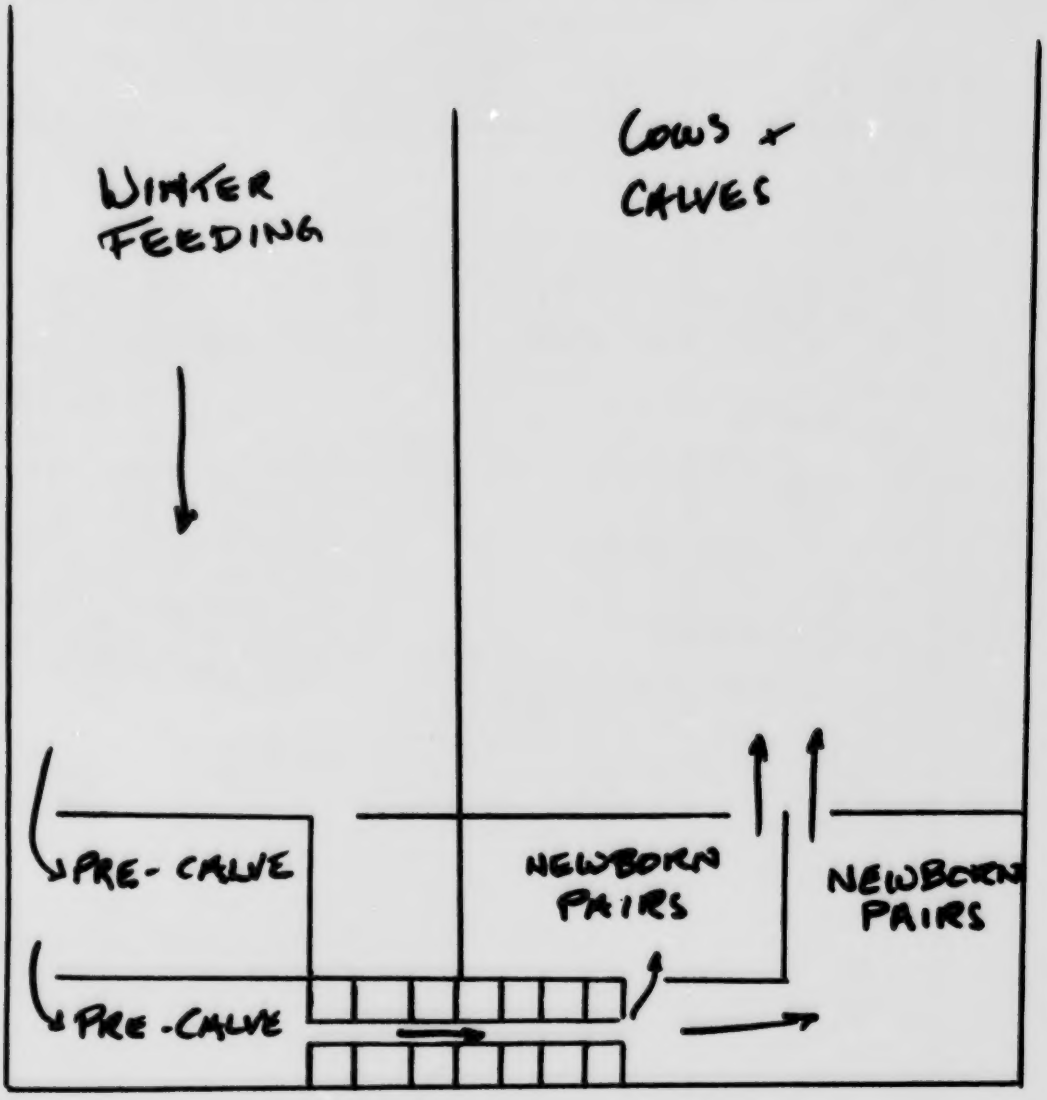
Description of This Cow (color, etc): _____ Sire Breed Code and ID: _____

Comments: _____

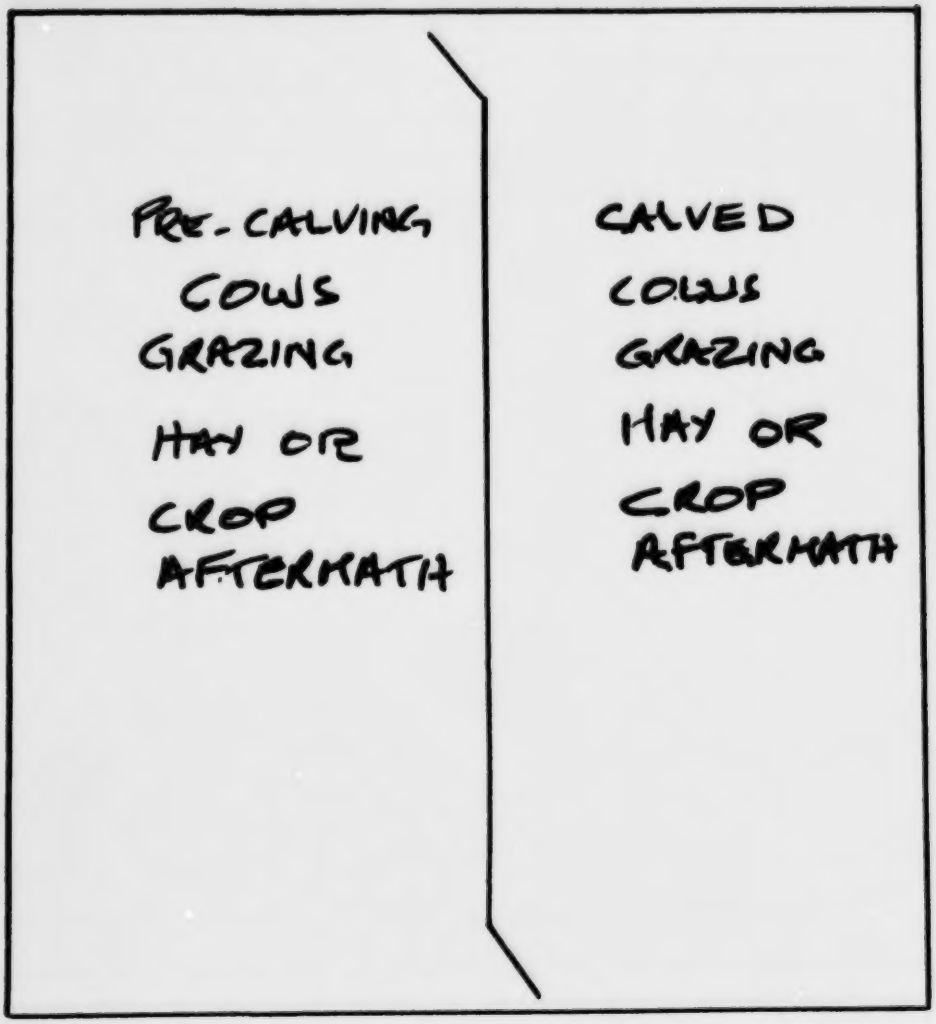
Comments: _____

CALVING RECORD FOR THIS COW

Calving Date	Calf I.D.	Sire I.D. & Breed Code	Calf Sex (F) or (M)	Calf Birth Wt. (lb) or (kg)	Calving Period 1,2,3,4, etc	Calf Birth Condition	Calving Ease	Cow Problems	Maternal Scores	Weaning Information	Preg Test Results	Comments
Day / Month / Year						(1) Normal (2) Weak (3) Dead	(1) Natural Birth (2) Assisted (3) Caesarian	(1) Retained Placenta (2) Uterine Prolapse (3) Maternal Neglect	CIP Maternal Score MPPA	DW Wean Date CIP Wean Score Sold (S) or Replacement (R)	OK On-Time L Late O Open	



CALVING FLOW PATTERN
WINTER-SPRING CALVING



FALL CALVING FLOW PATTERN

CIP – PEACE COUNTRY CATTLE IMPROVEMENT PROGRAM

RECORD OF THIS COW

OWNER: _____

Birth Date: _____ Purchase Date: _____

Birth Weight: _____ Purchased From: _____

Calving Period Born In: _____ Purchase Cost: _____

Maternal Score of Dam: _____ Culling Date: _____

Comments: _____ Culling Value: _____ Reason: _____

Weaned Score: _____ Dam Breed Code and ID: _____

Description of This Cow (color, etc): _____ Sire Breed Code and ID: _____

Comments: _____

COW IDENTIFICATION
(list eartags, kinds, brands, etc.)

CALVING RECORD FOR THIS COW

Calving Date			Calf I.D.	Sire I.D. & Breed Code	Calf Sex (F) or (M)	Calf Birth Wt. (lb) or (kg)	Calving Period	Calf Birth Condition			Calving Ease			Cow Problems			Maternal Scores		Weaning Information				Preg Test Results			Comments
Day	Month	Year					1, 2, 3, 4, etc	Normal (1)	Weak (2)	Dead (3)	Natural Birth (1)	Assisted (2)	Caesarian (3)	Retained Placenta (1)	Uterine Prolapse (2)	Maternal Neglect (3)	CIP Maternal Score	MPPA	D	Wean Date M	CIP Wean Score	Sold (S) or Replacement (R)	On-Time OK	Late L	Open O	

Herd Health Management Program for Cow-Calf Operators

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The beef herds on western Canadian farms have often been secondary to grain farming. With the advent of poor grain prices and uncertain climatic conditions the beef herd can play a more important role in increasing and stabilizing farm income. Careful herd management can increase the profitability of a cow-calf operation and an important part of herd management is a good herd health program.

A herd health program should not just be simply a vaccination schedule but rather a system of planned production and health management. An effective herd health program should set specific production goals, measure progress, plan and take specific actions. This involves developing and using a herd record system, determining the deficient areas and developing and implementing the required changes to improve the herd. The goal of a herd health program is not just improving the health, but also the production and profitability of the herd.

Any health and production program will require some type of record system to identify and monitor problem areas. At the simplest level this would involve basic inventories of cattle and a calendar of herd events (eg. date calving started, date bulls with cows, date of weaning). The individual identification of cows and calves plus a weigh scale allows for more sophisticated records for the herd and individual animal. One of the most basic measures of productivity in a beef herd is the number of calves weaned per cow exposed to

bull(s). Ideally each cow bred should wean one calf each year. A herd health program can work to improve herd profitability by increasing the reproductive efficiency of the herd, increasing the number, average weight and quality of the weaned calves.

An important part of any planned herd production and health program should be your veterinarian. Traditionally veterinarians have worked on an emergency basis providing a service as needed, when an animal was sick or a cow had trouble calving the veterinarian responded providing a service for a fee. Many veterinarians would be delighted to work with farmers in a consultative role to prevent problems and enhance production in the herd. This allows veterinarians to utilize their skills more fully and avoid some of the emergency type of problems. When the veterinarian is involved with you in planning your herd health program they can respond more quickly and knowledgable to your problems since they are very familiar with your herd. The number of visits and time spent setting up a program for your farm will vary with the size and need. Some larger herds set up regular visits over the year to examine animals and records and to review procedures. Smaller herds may need only occasional visits to the farm with a review of records and problems at the veterinarians office. Payment for these consultations is sometimes based on a production incentive program (so much per calf weaned), on a herd size basis (so much per cow), an hourly rate or fee for services performed. Involving your veterinarian in your herd health management should be a mutually beneficial arrangement that increases your profit and theirs as well as being more fulfilling than simple responding to emergencies.

Each farmer and each beef herd will have different goals and potentials. A large cattle ranch, a pure bred breeder selling bulls, and a smaller herd on a mixed farming enterprise will all have different requirements and need the development of a unique program for each place. However there are some general recommendations that can be made for each group

of animals in a herd and for each season of the year.

Replacement heifers may be the most important group of animals in the herd. The management of the heifers will affect the future profitability of the herd. It is widely accepted that heifers can be successfully calve at 24 months. To do this however the heifers must be sufficiently mature to be cycling and fertile by 15 months and large enough to calve at 24 months. Heifers must reach a minimum weight by 15 months in order to be bred. This weight will vary from breed to breed and farm to farm but generally the exotic breeds are later maturing and should be larger before breeding. Heifers should be fed to gain at least a pound a day from weaning until breeding and will require more feed than cows from the time of breeding until calving because they are growing as well as supporting a fetus. Heifers should be vaccinated for the diseases that may cause abortion before breeding as well as the other vaccines the cow herd gets.

Ideally each cow should wean a calf every 12 months. Not only should they calve every 12 months but it is desirable for the cows to calve over a short period of time to reduce the time spent supervising calving and so that the calves are uniformly sized at weaning. This means she must be fertile soon after calving, become pregnant, maintain the fetus, calve and then nurture the calf through to weaning. This requires strict attention to nutrition, management and health care. A cow that is too fat or too thin at calving will have more trouble calving and take longer to get pregnant again. This will result in open cows and late-calvers. Vaccination programs should be carried out as needed to protect the cows and their calves.

Bulls are usually selected for their body confirmation, growth characteristics and breeding. Often their most important trait is ignored, their fertility. All bulls are not created equal

when it comes to fertility, while only some bulls are sterile there are many bulls that have unsatisfactory fertility. These bulls may always be able to get some cows pregnant, given a long enough breeding season. Ideally a good breeding bull can cover many cows early in the breeding season and help to keep the cows calving on a 12 month schedule. Bull testing involves palpating and observing the reproductive organs, measuring the testicles and collecting and examining the semen sample. It may also involve testing the bulls serving capacity. Testing bulls can increase the profitability of the herd by reducing the number of bulls that need to be kept (the same amount of money may be spent but used to buy better quality bulls), more cows can be settled early in the breeding season, and by selecting for improved fertility the general fertility of the female offspring should improve. Nutrition is very important in young growing bulls, frequently they are overfed and obese and this can permanently damage their reproductive capacity. Leg and foot conformation are very important since lame bulls can't do their job. Bulls should be on the same vaccination schedule as the cow herd except they do not require scours vaccines.

The calf crop is the important product of the beef herd. A herd health program should work to increase the numbers of calves per cow exposed, the average weight per calf and the quality of the calves. A short breeding season has many beneficial results. It will reduce the calving period and thus allow more intensive supervision, assistance and early treatment when needed. During long calving periods it is more difficult to maintain the level of observation and assistance needed. The calves are more uniform in size at weaning time following a short calving period and this generally means a larger average weight (no small late calves) and groups of even sized calves that will usually command a higher price. Calves should be implanted at birth to increase growth rates. Preconditioning (preweaning and vaccinating) the calves before sale may increase their sale value.

In the spring before breeding begins, the pre-breeding planning should take place. New bulls should have complete reproductive examinations and semen evaluations before use and herd bulls should be examined and palpated for any potential breeding or fertility problems (eg. severe scrotal frost bite or infections or damage of the reproductive organs). Cows and heifers should be checked for their body condition and if needed they should be put on a higher level of energy to flush them prior to breeding. The bulls should be bred to the heifers approximately 28 days prior to the rest of the cow herd because it generally takes a longer time for the heifer to begin cycling again after her first calf then a mature cow. By breeding and thus calving the heifers early they have the extra time needed to begin cycling before they are bred the second year. Special programs such as synchronized breeding or embryo transplants may be considered at this time. This is also a good time for castrating, dehorning, branding, implanting and initial vaccinations of the calves before they go out on summer pasture with the cows.

Pregnancy examination may be done as early as 8 weeks after the breeding season is over though it is usually done later in the fall. The cows should be classified as open, or early or late pregnancies. This is also the best time to do an overall examination of the cows for cancer eyes, lameness, mastitis, and poor calves. Cows with problems should be selected for culling and kept with the open cows for sale when fat. Cows should be checked for their body condition at this time. Body condition scoring is an easily learned technique for assessing the cow's condition. Cows that are thin may require 50% more feed to get them into the appropriate condition for calving and rebreeding and may need to be segregated for separate feeding from the rest of the herd. Pregnancy percentages (pregnant cows/cows exposed to bulls x 100%) and late pregnancy percentages can be calculated at this time as a record of reproductive efficiency.

Calves are usually weaned around the same time. Three weeks before the calves are weaned they should be vaccinated and any missed dehorning and castrating can be done at this time. The time of weaning is a period of stress for the calves and they are more susceptible to disease problems such as pneumonia. A planned treatment program should be established prior to weaning and calves should be observed carefully twice daily after weaning so that treatment can begin as early as possible once sickness is detected.

Scour control programs should be started in the fall. If vaccination is appropriate the cows may need their initial vaccine at this time. Calving in the same pen the cows over winter in increases the risk of infection for the new born calf. Suitable penning should be arranged before winter starts.

The calving period is the most labour intensive time of year in beef herd operations. Before calving begins it may be useful to review calving procedures with your veterinarian. Determine how much you can do yourself and find out from your veterinarian when you should call for assistance. If you must haul cows into a clinic for calving assistance arrange for a trailer or truck before calving begins. If your veterinarian does cesarian sections on the farm make sure that you have a suitable area prepared for surgery or assistance. Records of the need for calving assistance should be kept and may influence the selection of bulls or influence the feeding program in future years. During the calving season the early calving cows should be separated from the late calving cows so that observation time can be concentrated on the cows that need it. As the cows are ready to calve they should be brought into a well bedded calving area for closer observation. Once a cow has calved successfully and accepted her calf she can be moved to a separate nursery area. The use of separate paddocks or pens for wintering, precalving, calving and nursing will reduce the level of contamination of the pens with the scour organisms and reduce the infection of

calves. A scour treatment program should be set up with your veterinarian so that early treatment can be given to any cases and severe dehydration and mortality avoided.

Vaccination requirements will vary from area to area as well as farm to farm. Most herds vaccinate for clostridial diseases with a two-way vaccine but in some areas it may be appropriate to use a 7 or 8-way clostridial vaccine. It may be necessary to vaccinate for Infectious Bovine Rhinotracheitis virus (IBR), Bovine Viral Diarrhoea (BVD), Leptospirosis, and Vibriosis to prevent abortions. Some scour problems will respond to vaccination programs but the type of problem should be determined by a veterinarian so that the appropriate vaccine is used. Vaccination of calves for respiratory disease problems may be useful if this is a common problem in your area. There is an almost bewildering array of vaccines and diseases, some vaccines may have no value in your herd and others may be useful if used correctly. Your vaccination schedule should be set up in consultation with your veterinarian to provide the best program for your farm.

A planned herd production and health program can improve the profitability of your herd. Traditionally the beef industry has been one of the slowest in agriculture to adopt new methods for improved efficiency and production. By better utilizing proven management techniques and your veterinarians skills you may be able to improve your herd management and productivity.

CATTLE HANDLING SYSTEMS THAT WORK

L.T. Jones
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Alberta Agriculture

During the formation of the Canadian ranch cattle industry, most of the handling methods developed in the U.S. were used. The lariat was the means of restraint, and the cow horse was the anchor. Heading and healing were the traditional ways of holding animals for doctoring, branding, dehorning or castrating. Healing with a lariat was the fastest method for calf handling. On some ranches, it remains the chosen method.

Using ropes and horses required only a large corral, or an open flat stretch where a herd could be held. Skilled ropers and trained cow horses were common on cattle ranches.

Our cattle industry is not a ranch industry, and has only a little of the old ranch traditions. We are primarily grain farmers, who may or may not have cattle. Few if any good cow horses or ropers are around on our farms. That is part of our problem. The other, and most important drawback, is that we have few working corral setups that can be used as good examples for our beginning cattlemen.

Rather than dwell on what we don't have, I wish to discuss the parts of a good cattle handling setup that we should have.

The Holding Corral

This is the basis of a good handling facility. The cattle to be "worked" are stored in the holding corral for processing.

The holding corral must be just as strong as the rest of the handling system. It can't be a barbwire enclosed field. It doesn't

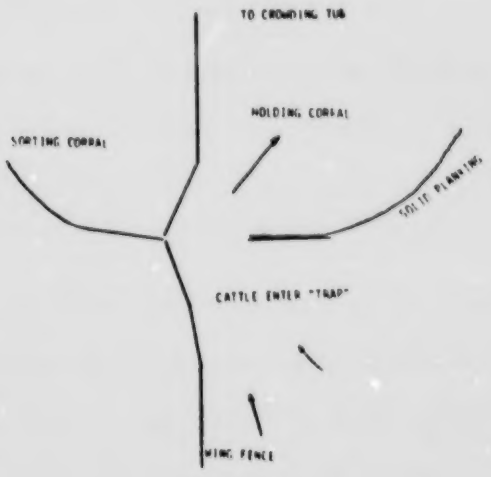
have to be big enough to hold the whole herd, but should hold at least a liner load of cattle.

The access to the holding corral requires careful planning. The gateway has to be a "trap" that cattle will easily move into. A "wing" provided by corral type fencing should lead the cattle to the corral. The closer the cattle get to the "trap", the stronger must be the fence.

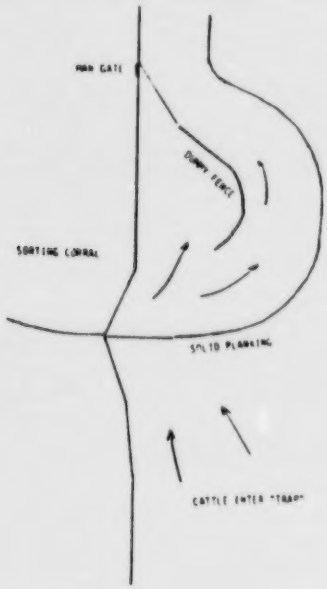
Cattle go through a "fight" or "flight" reaction. In the majority of cases, flight is the usual reaction -- the cattle tend to run away from the handler. When trapped, with no place to go, some cattle will fight, or charge the handler.

During flight, cattle almost never travel in a straight line away from the handler. They tend to circle, and keep their rear vision (which is excellent), on the person moving them. For this reason, all corral handling systems should be curved, never square or with right angle corners.

A good handling system must move cattle from the large holding corral, to the small squeeze. The plan must be clever enough to provide the cattle with a seeming escape from the handler, and in the process they work themselves deeper into the trap.



The holding corral may simply be a 12' wide alley leading to the crowding tub. If the holding corral is a large area, it may be difficult to push cattle into the crowding tub because they can circle back into the large area of the holding corral. By putting a dummy fence in the holding corral, this problem can be eliminated, without loosing any of the capacity of the holding corral.



Cattle "flow" when they travel in a group, and curved fences will lead them to the "trap".

The use of solidly planked fences to prevent cattle from seeing movement, or other cattle, will make handling much easier. Solid planking one side of the holding pen near the entrance gate will encourage cattle to enter th gate rather than stop and watch!

Before deciding on the location of the holding corral, first decide whether you will have a right or left side brand to apply in the squeeze. The cattle should leave the holding corral through the crowding tub, chute and squeeze in a right hand direction for a right side brand, and to the left for a left side brand.

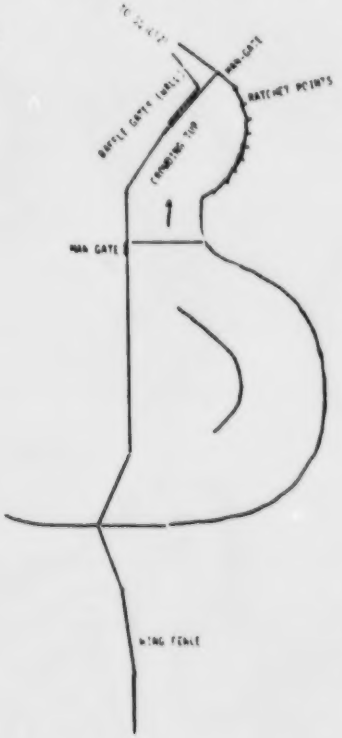
From Holding Corral to Crowding Tub

There should be a short space between the holding corral and crowding tub, closed by a gate at the holding corral end. One way to save space is to incorporate the dummy fence, previously described to prevent cattle circling in the holding corral.

Whatever method is used, the alley leading to the crowding tub should be 12' wide. An escape man-gate should be positioned somewhere in the alley.

The crowding tub needs careful planning, and the gate should lock on a ratchet point at each post in the perimeter of the tub. The maximum area is ½ a circle with a 12' radius (gate), or 226 sq. ft. The curved side of the tub is usually about 25', with ratchets at posts approximately 2½-3' apart. By the time the crowding gate strikes at the first ratchet point in the tub, about 147 square feet of "trapped" cattle are secured (10 cows, 15 yearlings).

It is important that the tub and outside fence of the holding corral be solid planks.



The Crowding Gate

The crowding gate must be heavy, easy to push, and solid so that cattle can not see the handler behind them. The extra investment in plywood to cover the gate planks to create a solid wall around the cattle (so that they will neither have flight nor fight reactions), is money well spent. In fact some operators value solid fences so much that they start right at the entrance to the holding corral.

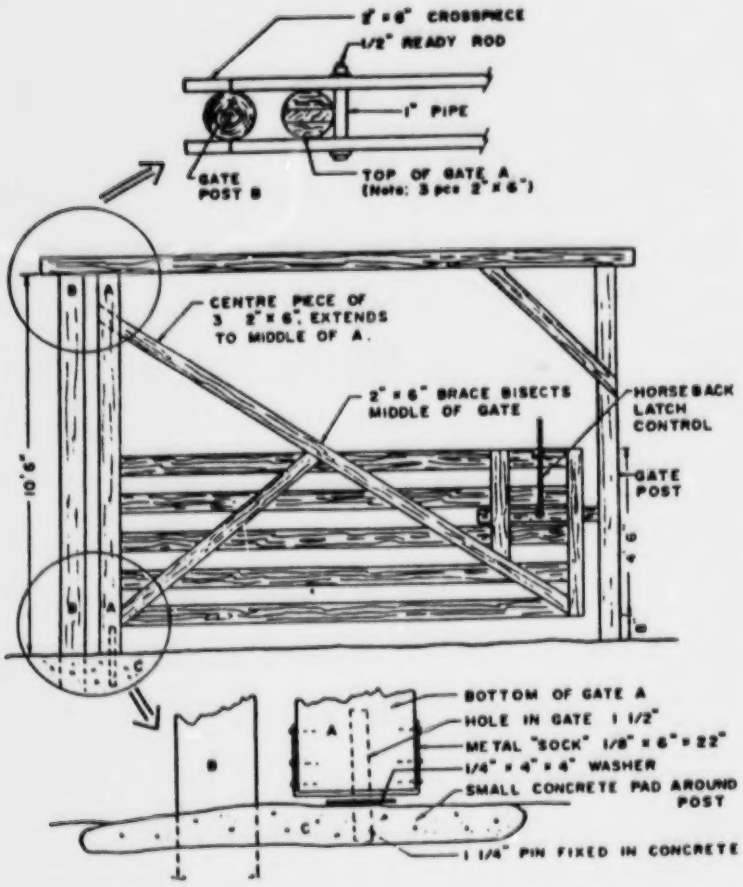
The crowding gate is usually 12' long, and swings in an arc behind the cattle, and is the final point of the whole trap. Once the crowding gate swings behind the cattle, they are caught for good! The crowding gate should have a ratchet latch which prevents cattle from pushing it against the operator. A man-gate should be located near the swivel end of the crowding gate providing direct access to the chute and squeeze.

This man-gate is exposed when the crowding gate is locked on its final ratchet point in the tub, but hidden when the crowding gate is fully open.

Another man-gate should be located in the last ratchet panel of the tub, to provide quick exit to the loading chute, once the crowding gate is fully closed.

The Gates

Possibly the most important part of a handling system, gates must be strong, quiet, able to swing at least 300° and must not sag or pull the fence down. One of the best designs is that used for over 100 years in southern B.C. Originally made from Jack Pine rails, these gates can be made form planks, rails or steel, provided the hinging principle is observed.


3" x 6" CROSSPIECE
1/2" READY ROD
1" PIPE
GATE POST B
TOP OF GATE A (Note: 3 pcs 2" x 6")
CENTRE PECE OF 3 2" x 6", EXTENDS TO MIDDLE OF A.
2" x 6" BRACE BISECTS MIDDLE OF GATE
HORSEBACK LATCH CONTROL
GATE POST
10'6"
BOTTOM OF GATE A
HOLE IN GATE 1 1/2"
METAL "SOCK" 1/8" x 6" x 22"
1/4" x 4" x 4" WASHER
SMALL CONCRETE PAD AROUND POST
1 1/4" PIN FIXED IN CONCRETE

Beyond the Crowding Tub

The crowding gate forces the cattle into an initial "V" end of the narrow single file chute leading to the squeeze. The chute curves in an arc to the left for left side brands, or to the right for right side brands.

The "V" sides can be hinged to swing open to deflect cattle to the working area on the inside of the chute arc. The latter gate is great for providing access back into the tub, but also as a secondary chute access leading to a calf cradle.

The Working Chute

The chute leading to the scale and/or squeeze lines the cattle up in single file. Many different opinions exist about the width of the

chute. The reason for this is that there are many different sizes and ages of cattle worked. The following recommendations should be considered.

a) If only yearling, or small frame cows are worked, then the finished inside chute width should be 28", with vertical walls.

b) If large frame cows are worked, the chute inside width should be 32"-34" at 32" height.

c) Sloped chute walks may be used, with inside width between posts 18" at ground level and 32"-34" at 32" height. All chute walls should be solid planked, with 6" gap at the bottom, and at least 5½' to the top.

d) The working chute at the outside wall, should describe an arc of a circle that has a radius of 24'. To prevent cattle from backing up, 5/16" chain may be strung across, with a 10' sag. Cattle walk under the chains easily if they are not alarmed by rough handling. Chain settings can be made at various heights.

e) A catwalk, built around the inside of the working chute will allow easy "pour-ons", or even chute vaccinating.

f) The end of the chute can be fitted with a sliding door, just in front of the vet gates at the squeeze.

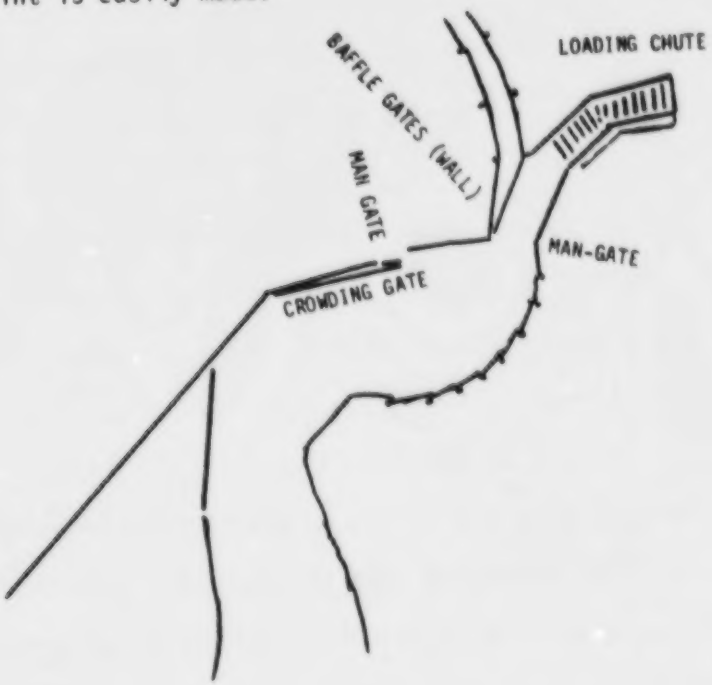
The Loading Chute

The wall baffle gate swings across to deflect crowded cattle from the tub to the loading chute. There should be at least one bend, preferably one-half way up the ramp, so that cattle start up the loading ramp, but can't see the opening into the truck. Use a long ramp (16'), with solid planked sides.

There are two opinions about loading chute width -- either that they are single file width, or oversize, so that if an animal does get going the wrong way, it can turn around easily.

The planking on the floor of the loading chute can be extended 2' to allow for a catwalk on the outside, from the man-gate at the tub, to the truck.

By hinging a section of wall in the loading chute, a trailer loading point is easily made.



The Scale

A single animal scale is extremely useful, and may be installed at one of several different places.

a) As a by-pass, in the single file chute.

b) In-line before the squeeze.

c) Beyond the squeeze, in one sorting corral.

Sliding doors are an excellent means of blocking in front and behind the scale.

The Squeeze

Squeezes come in many sizes, shapes and costs. Before buying one, find out how other cattlemen like that model.

A home built "blind box" with a commercial headgate, and a sliding door behind, works amazingly well. A drop side for branding can be built in.

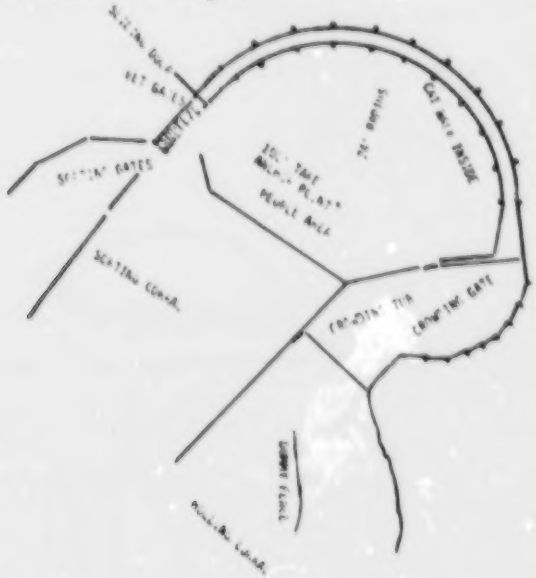
The Sorting Gate(s)

Directly opposite the headgate is the sorting gate. More than one may be positioned if more than one sorting corral is to be used.

The Sorting Corrals

Sorting corral sizes may be more critical than the holding corral size, because there may be other areas cattle can be held before entering the holding corral.

The planning should provide some way of putting cattle easily beyond the sorting corrals, without interfering with the incoming cattle in the holding corral. Cattle should be able to be sorted for re-entry into the holding corral from the sorting corrals -- hence the need for a circular type of corral design.



The People Area

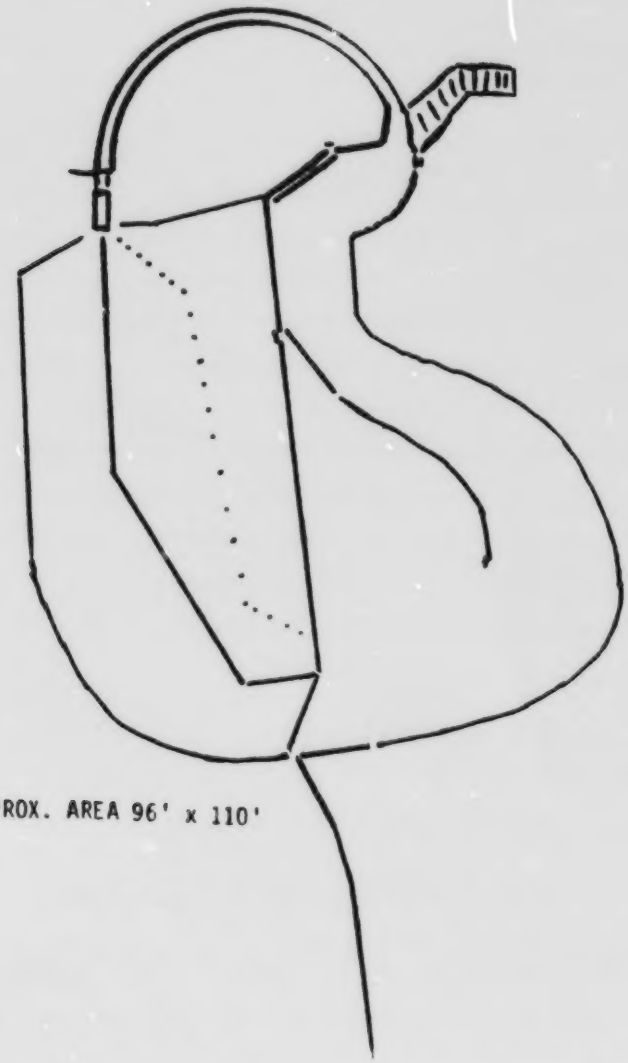
By fencing across from the man-gate at the crowding tub, to the squeeze, a safe working area inside the arc of the chute is provided. This area can also be used as a calf branding area by hinging the inside wall panel of the "V" entry to the circular chute. Calves can be crowded directly into a calf chute and branding table, then released into a sorting corral.

Finally, Some Pointers

1. Stake out your corral plan. Use 6" spikes, with different color flagging to show different post sizes.
2. Join up all the spikes with baler twine and "walk" through your system. Use different colored baler twine for gates, and allow gate twine to open and close.
3. Space your flagged spikes so that your lumber or rails will fit. For 16' material, flagged spikes go at 8' centers; for 14' material, flagged spikes go at 7' centers, etc.
4. Drill undersize holes and pound posts in with a post driver where possible. Use a carpenter's level to get posts vertical.
5. Use spiral nails with washers to spike green planks.
6. Use wood preservatives on all wood.
7. Have corrals at least 5' 6", and preferably 6' high.
8. Rails make excellent corral material, not only for fences, but gates as well.
9. If rough lumber is available use 2" x 6" rather than 2" x 8".

10. Take time to build well, the results will be there for your lifetime on the farm.

COMPLETED HANDLING SYSTEM



APPROX. AREA 96' x 110'

The following corral costs for material (and labour allowance) was prepared by Allan Barnes at High Prairie, Alberta, for his 150 cow herd in the summer of 1988.

WORKING CORRAL SYSTEM (150 COWS)

ALLAN BARNES, HIGH PRAIRIE, ALBERTA

Post Hole Digger (Rent)		90.00
Posts:	114 posts 6" x 10' @ 8.25 16 posts 6" x 12' @ 14.60	1197.00
Preservative:	Pentox (8 litres)	33.90
	paint dye (green)	66.00
	Penta concentrate (40 litres)	213.00
Cement and rebar		97.35
Gravel		45.00
Nails:	5 inch (4 boxes)	144.35
	4 inch (1 box)	36.00
Washers:	17½ lbs 3/8"	46.00
Bolts:	50 pcs 3/8" x 3"	19.50
Iron:	6" flat iron x 12 ft -- Redi Rod ¾" x 12 ft	40.00
	nuts and washers Redi Rod 3/4" x 12 ft	24.30
	2" x 2" angle iron x 1/8" x 20 ft	34.60
Pipe:	6" x 3 ft	10.00
Hinges:	2 pair $25.50 (6" round) 5 pair $28.38 (flat iron type)	53.88
Door track and hanger		69.00
*Lumber:	6440 board ft @ 200.00 F.B.M.	1288.00
Labour:	234 total hours (No Charge)	$3507.88

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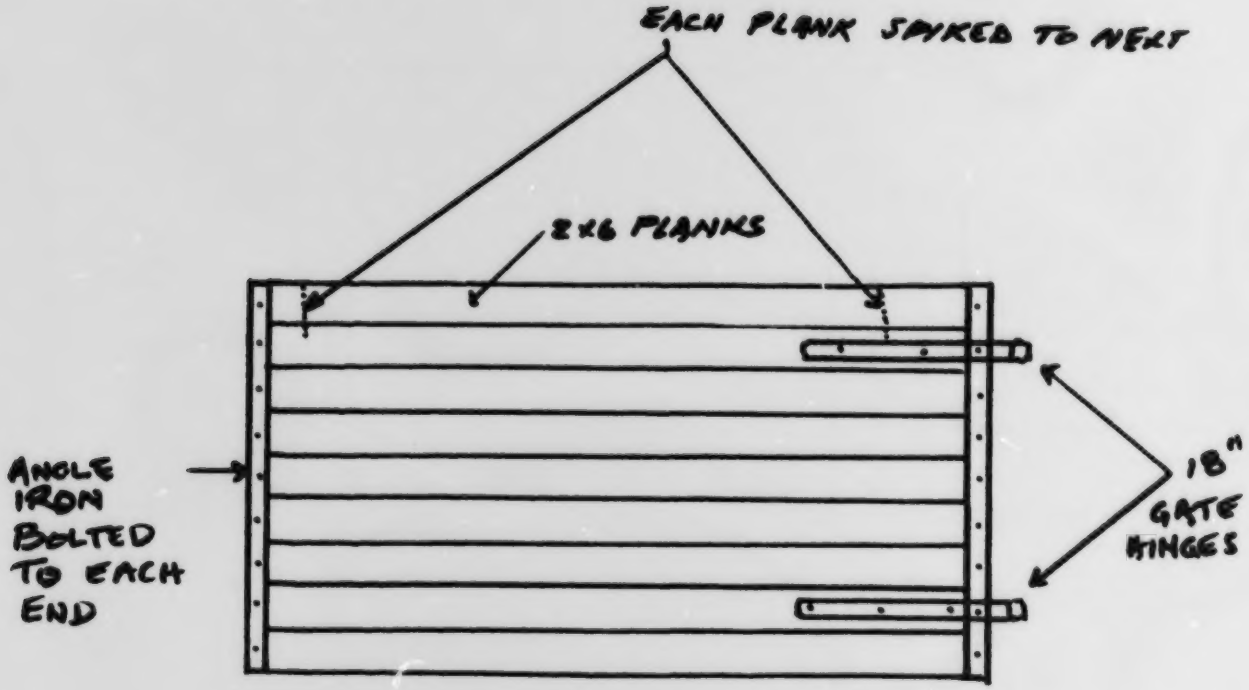
*LUMBER

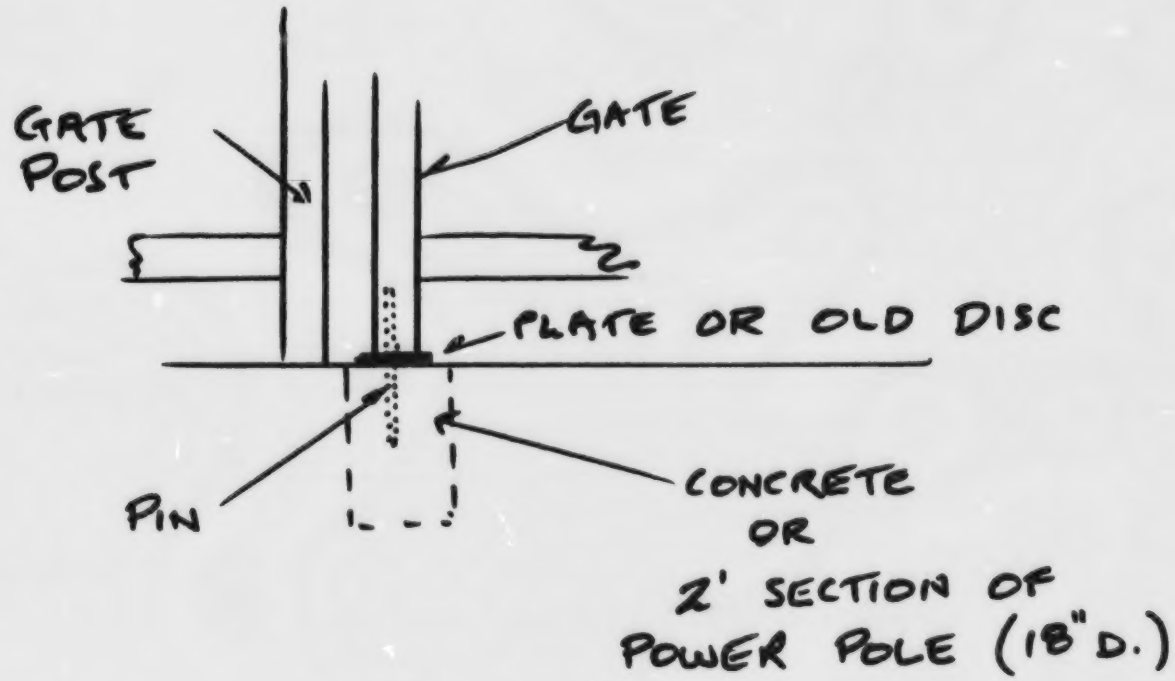
Crowding alley	88 boards 2 x 8 x 12	1408
Tub and pen	80 boards 2 x 8 x 12	1280
Loading chute	42 boards 2 x 6 x 16	672
10 gates (124 bd ft of each)	50 boards 2 x 6 x 12	600
	40 boards 2 x 6 x 16	640
3 holding corrals	70 boards 2 x 8 x 12	1120
	60 boards 2 x 6 x 12	720
		6440 Board Feet



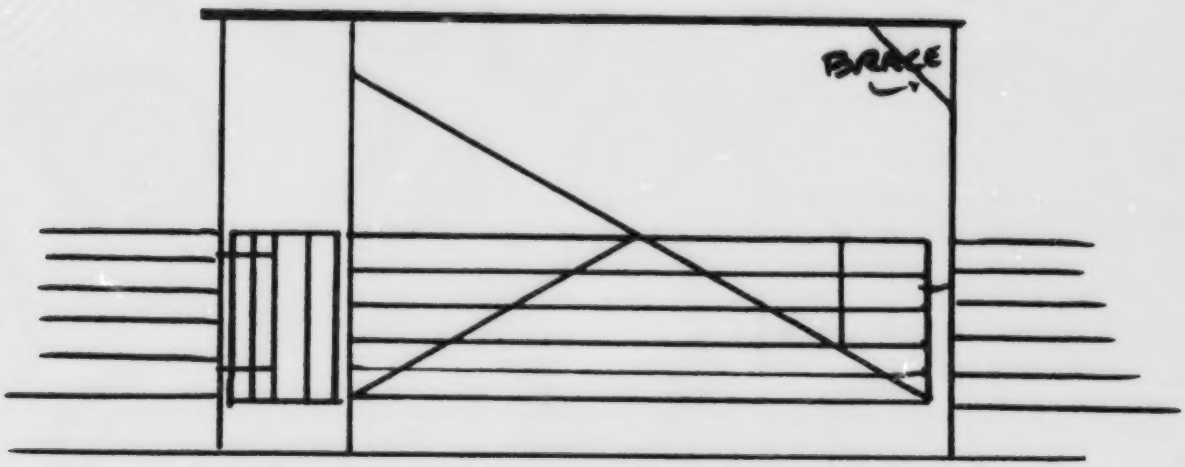
"BAFFLE" GATE WALL

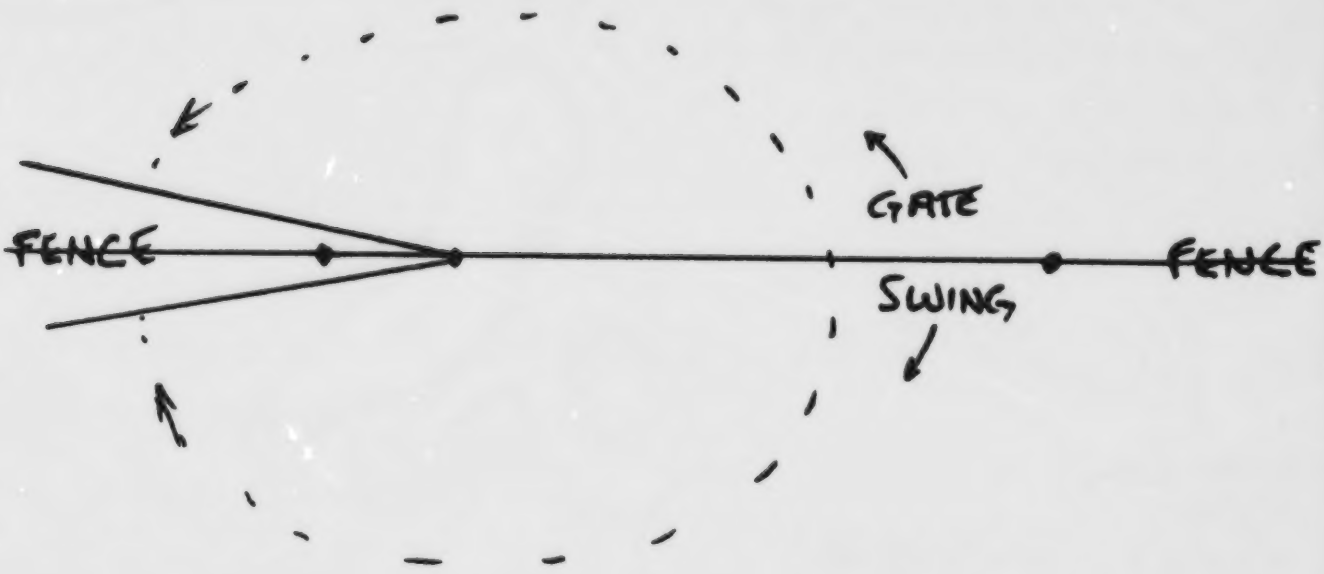
IN CHUTE - SENDING CATTLE TO LOADING RAMP OR TO SQUEEZE

BOTTOM PIVOT POINT
LARGE GATES



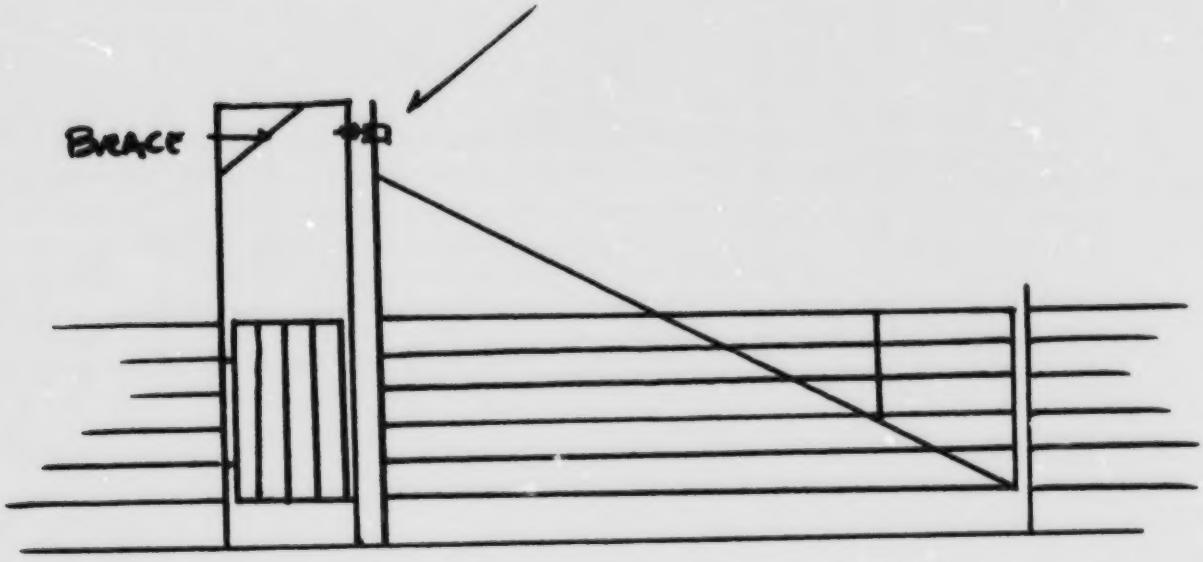
FRAMED GATE

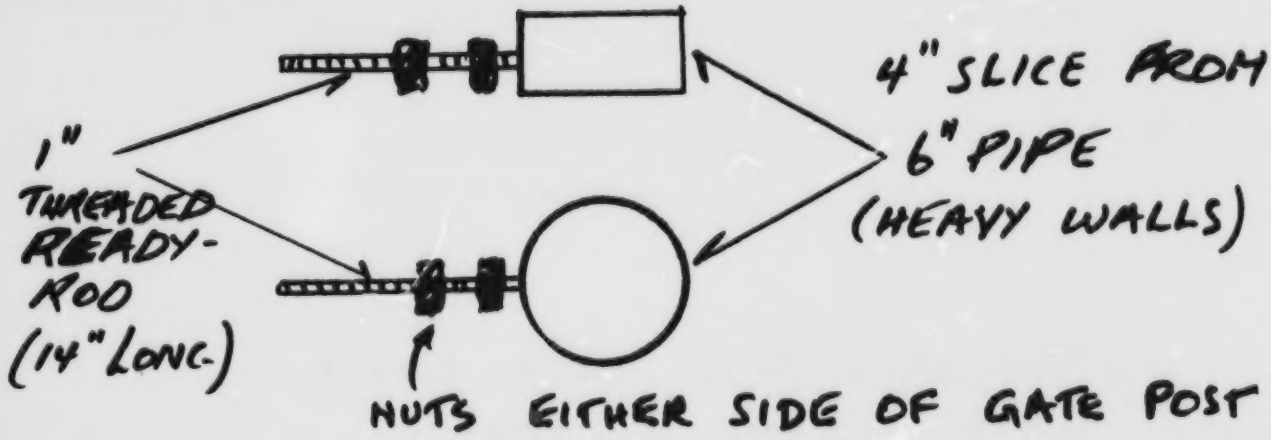




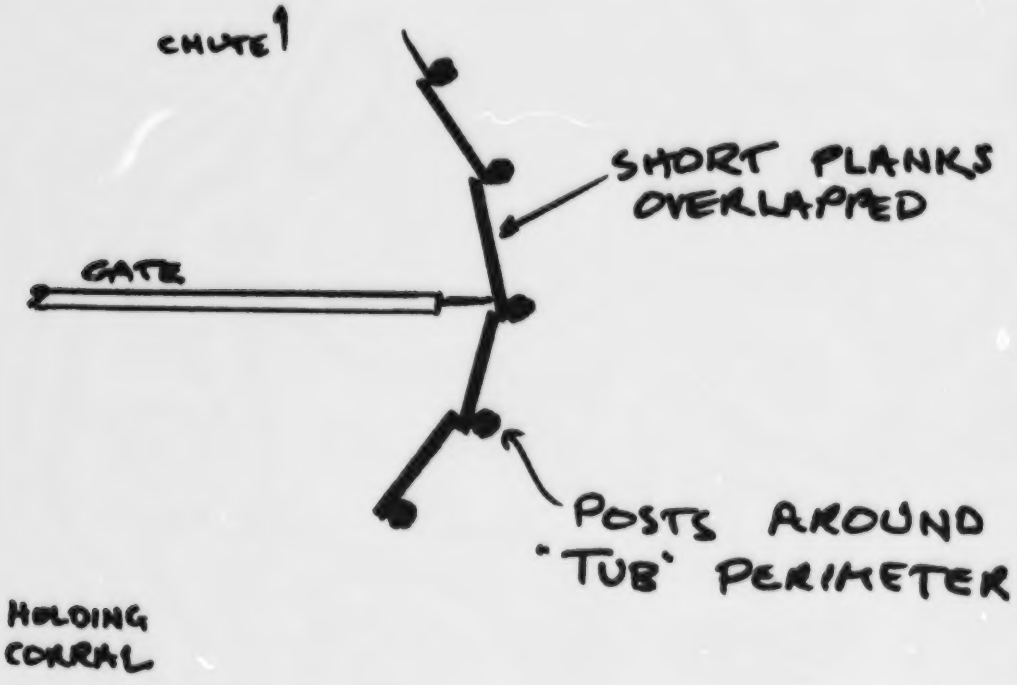
MAN-GATE BUILT INTO LARGE GATE FRAME INCREASES ARC OF GATE SWING

GATE RING HINGE, NO FRAME

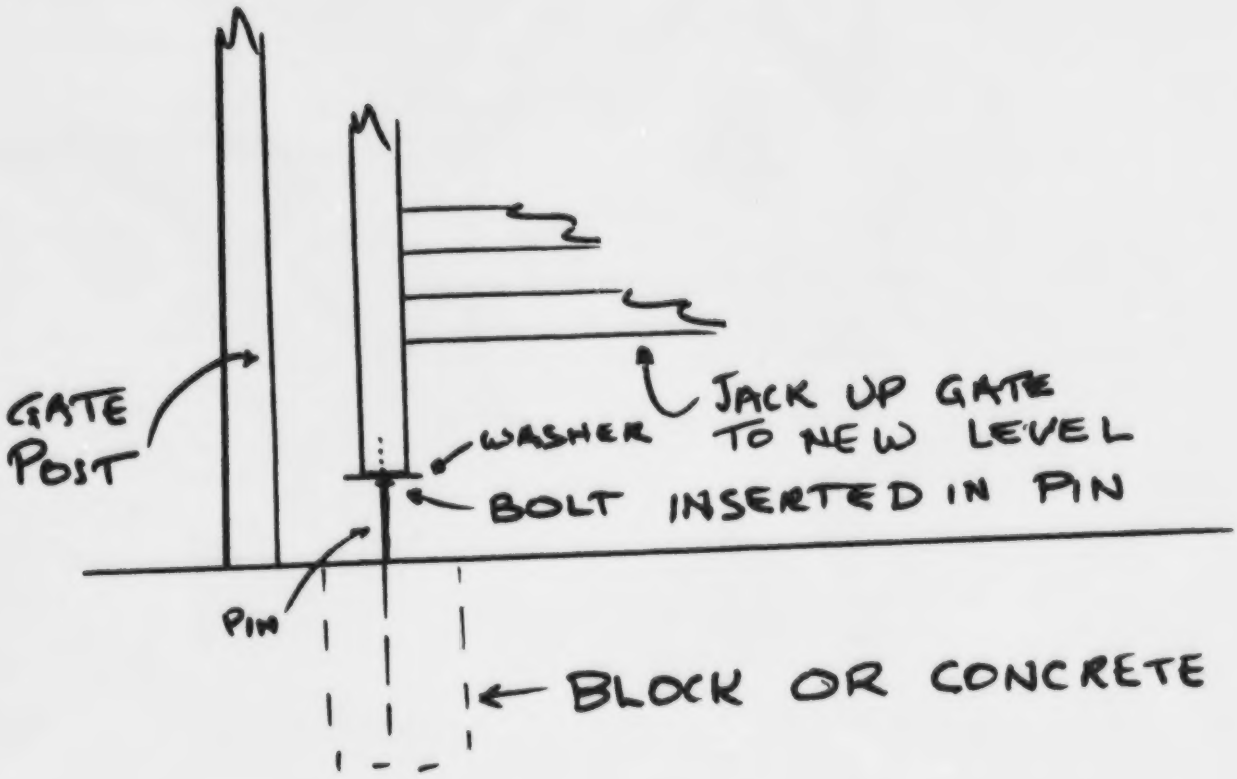




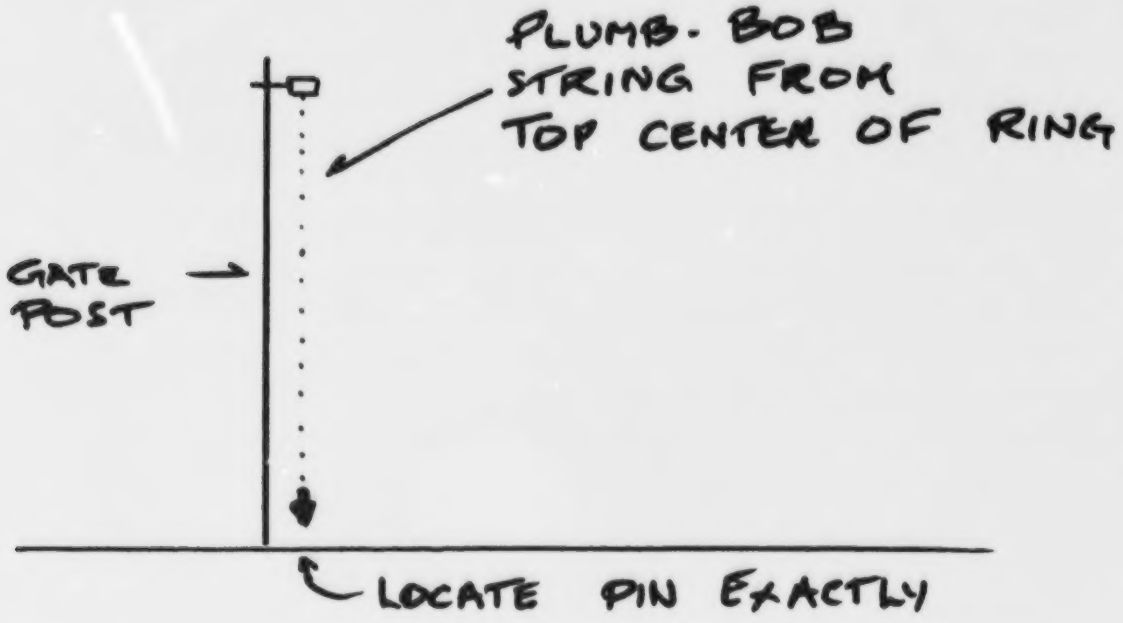
CROWDING TUB WALL CONSTRUCTION FOR CROWDING GATE RATCHET EFFECT



TO RAISE GATES FOR SNOW CLEARANCE



ALIGNING HEAVY GATES, UPPER HINGE TO BOTTOM PIVOT POINT



Manitoba Climate: Past, Present, and Future

Ironically, the earliest recorded attempts at organised European style agriculture in the province of Manitoba occurred along the shores of Hudson Bay. Employees of the Hudson's Bay Company planted gardens of vegetables, but they also attempted in 1721 to grow barley. Unfortunately they were not very successful at Churchill, even though they took pains to clear and level a half acre of land The permafrost and the weather conditions proved too much.

Weather continues to be the major controlling factor in Manitoba agriculture, even though it is now confined to the southern regions of the province. The second factor determining the extent of agriculture are the soils. At present extensive areas in the north are not suitable because of the climate. However, if the global warming continues, as some experts believe, these areas will become available to a northward extension of some agriculture.

This is the positive side of a warming trend, but are there any negative sides? Some believe that the warmer conditions will result in much drier conditions with more frequent and severe droughts. Others believe that agriculture will benefit from longer frost free periods and although it would be drier there would be more rainfall. Can anything be established with any certainty at this point? How much of the current warming is due to human activity? How much is due to natural trends? What do we know about climate mechanisms that would provide some certainty about the general forecasts for the next fifty years? What do we know about weather patterns of the past? Clearly many of these questions are beyond the scope of this presentation, however, many can and will be examined.

First it is essential to look at the large scale, long term, control of climate. Changes in the tilt and orbital chartacteristics of the earth cause variations in global temperature. The effects of these changes apparently were responsible for the major ice sheets that developed and covered most of Canada. The ice sheet began to melt and retreat approximately 18,000 years ago. Over the next 6000 years most of the ice melted and large lakes and extensive glacial deposits were spread across the land. A major question raised by this rapid melt. Where did all the heat energy come from to melt that much ice that quickly?

At present the changes in sun earth relationships indicate that the long term trend is toward another ice age. We appear to be in a very warm intergiacial period that began with the ice retreat and will apparently end some 23,000 years from now as the temperature gradually falls. Surprisingly, as the ice melted the earth continued to warm and by approximately 5000 years ago it was much warmer than at present. In fact it was warmer than even the most extreme Greenhouse predictions. During this time the Boreal forest extended to the high arctic and sea levels reached maximums in the post glacial period.

It is too simple to say that these changes are on a time scale that are not significant in any current study of climate. They must be part of an assessment of any future climate trends if an accurate picture is to be achieved. Generally the shorter the trend the more important it becomes in studying the impact of climate change. At a certain point the scale becomes irrelevant again. From an agricultural perspective the study of climatic trends suggests that generally the growing season is the minimal period of concern.

Evidence of more recent climates in Manitoba are rather sparse until we reach the fur trade era. Pollen data, sedimentary deposits and tree rings all provide some idea of the general pattern. What we see from these collective sources is the constant warming and cooling trends, accompanied by wetter and drier periods as the mean position of the Arctic front moved. Perhaps the best picture is provided by the pollen analyses of Nichols at Ennadai Lake.

The fur trade records for the seventeenth century are extremely sparse and provide little information. The eighteenth century is a different situation. The establishment of posts at York Factory in 1714 and Churchill in 1718 meant that daily journals were maintained in which the weather was recorded. A thermometer and barometer were shipped to Churchill in 1768 giving it one of the longest instrumental climate records on earth. Cumberland House on the Saskatchewan River was established in 1774 and other inland posts quickly followed. Reconstruction of climate from these records confirm the larger trends that have been found in other parts of the world.

The most significant is the establishment that temperatures and conditions were much colder and more stormy than at present during the

eighteenth and first half of the nineteenth century. This coincides with the period that Lamb has called the Little Ice Age. A period when the type of agriculture currently practised would have been difficult if not impossible. The global warming began in approximately 1760 in Manitoba and was marked by a distinct change in the pattern of winds and weather. The trend was not a smooth or constant one as frequent excessive years and even decades occurred.

One thing that becomes apparent from these records is that there are distinct patterns of drought across the province. These are part of the general pattern of droughts that occur approximately every 22 years across the Great Plains of North America, of which the Prairie region is merely a northern extension. One of the worst periods of drought occurred between 1816 and 1819. Interestingly this was coincident with a period of extreme summer cold. 1816 was one of the coldest summers on record in central and eastern North America. Lake Winnipeg was covered with solid ice as late as June 20th. It is interesting to speculate on what such a period of climate would do to todays agriculture and economy.

The Selkirk Settlers arrived in 1811 just prior to these exceptionally severe years and as a result found conditions extremely difficult. Fortunately things were to improve after 1820. From then until the end of the nineteenth century conditions gradually improved as the global warming continued. The journals and instrumental records indicate that periods of drought continued although there were also periods of heavy rain. Donald Gunn recorded over 28 inches of rain for the July and August 1855, figures that exceed the total for the entire summer in most years.

The one factor that emerges very clearly is that the climatic pattern of Manitoba is one of extremes. It is these extremes that create the problem. It is increasingly apparent that the selling of the Canadian Prairies as a land of opportunity and ideal agricultural conditions is untenable. The region is one that exists at the northern margins of climate suitable for agriculture, particularly grain production. It is also apparent that when the world is warmer Prairie productivity increases, but when it is colder productivity drops significantly.

The droughts of the thirties brought home the warnings of Palliser and Hind about the drought cycles and the generally dry conditions that prevail over much of the Prairies. How quickly we forget. The 1940s, 50s, 60s and

70s were generally above the long term average for precipitation and many forgot the lessons of history. Windbreaks came down, sloughs were plowed under, poor soil and moisture practices prevailed once again. As a result when the snow cover failed, as it had in previous drought periods and the wind began to blow we saw spectres of the 30s once again. Instead of rationale analysis of the situation in the context of long term records and an understanding of the region and its conditions, we see panic occurring.

The current warming trend elicits concerned response from farmers across Manitoba. The whole concept of the Greenhouse Effect is presented in as a negative trend and something of great concern. The reason that this perceptionhas evolved and been perpetuated is because the United States, particularly the mid-west and west agricultural regions will become increasingly arid as the world warms. Most of the Prairie region will benefit from warmer conditions. Louise Arthur reported the scenarios that will evolve from warmer conditions.

The bigger concern should be about a cooling trend. If we adopt seeds, and techniques that are appropriate for warmer conditions and are then confronted with cooling we would be in some considerable trouble. If, however, we adopt strategies and seeds suitable for cooler conditions then we will be better prepared for either eventuality. It would seem that we are wiser to prepare for cooler conditions than warm as is currently the case. Regardless, we should recognize that variability, often extreme, is the more normal pattern for Manitoba.

Herd Health Management Program for Feedlot Operators

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University of Saskatchewan,
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A herd health program for feedlot operators has many of the same components as a herd health program for the cow-calf operator. One important difference is that disease prevention and treatment plays a much larger role in feedlot herd health programs. Many of the strategies for controlling and treating disease have been developed in large feedlots. Smaller feedlots have many of the same problems but they tend to occur more sporadically. In larger feedlots they often have one or more problem groups of cattle but at the same time many groups with few problems. Small farm feedlots may go for some time without any problems but then get an outbreak that affects all the cattle at once. Although overall the health problems are often lower in small feedlots a sporadic outbreak can have devastating effects and overwhelm the capabilities of the feedlot. A good herd health program can help reduce the possibility of these outbreaks and minimize the damage should one occur.

In any planned management system it is important to develop and use records to evaluate progress and to examine when problems occur. The overall productivity of the feedlot will depend on the average daily gain and the feed conversion of the cattle on feed. Health records for feedlots are very useful in the diagnosis of problems and the selection of treatments. It is helpful to have each animal individually tagged when they enter the feedlot, and a record kept of the date of arrival and all vaccination, treatments and diagnosis for that animal. This can be simplified by group records for herd treatments and individual cards to record individual treatments and diagnosis. Any deaths should have post mortems

preformed and the results kept as separate records.

Disease problems in feedlots often have familiar patterns. Although simple cures have not been found some of the observations on the nature of shipping fever have been useful in developing herd health programs. Shipping fever or fibrinous pneumonia is responsible for more than 50% of all mortality in the feedlot and pneumonia of all kinds probably is responsible for over 75% of all feedlot mortalities. Feedlot pneumonia usually follows a predictable pattern, especially in calves. Shortly after arrival the number of new cases of shipping fever will increase and usually peak around 12 to 14 days after arrival and gradually taper off to a low level by day 28 in the feedlot. If we just look at the cases that eventually die of shipping fever, they will peak earlier and taper off more quickly. In fact in many feedlots up to 50% of the calves that will die of shipping fever have already been treated in the first week in feedlot. Calves brought into the feedlot after weaning in the fall tend have more than twice the disease problems of yearlings and calves brought directly from the ranch or farm have less disease problems than auction bought calves. The greater the number of groups of calves there are in a pen the greater the disease problems tend to be. Besides this surge of disease after arrival in the feedlot there is always problems with other diseases such as Haemophilus somnus, coccidiosis, footrot, BVD, pinkeye and other types of pneumonia that can occur at any time in the feedlot. Nutritionally related diseases such as polioencephalomalacia, bloat and grain overload are not uncommon in small feedlots.

It is not always possible to avoid the higher risk circumstances but knowing the increased risk and the time when it is most likely to occur makes it possible to plan preventative and treatment programs. Higher risk calves may be purchased at attractive prices and thus worth the added effort and health risk. Since the majority of the fatal disease problem

occurs very shortly after their arrival in the feedlot prophylactic measures must be instituted immediately on arrival in the feedlot. The injection of a long acting oxytetracycline in high risk calves at arrival has reduced mortality by 50% and significantly reduced morbidity. Some people argue that vaccination programs should be delayed but since so much of the disease problem occurs so early in the feedlot it makes sense to vaccinate as early as possible to provide at least some protection during the early period in the feedlot.

The selection of sick cattle in a feedlot is an absolutely critical area in the health program. Successful treatment of disease in the feedlot is dependant upon early recognition and treatment of sick cattle. Pen checking can be a very difficult job especially in a pen of newly arrived calves. Since more sickness is expected in newly arrived calves they should be checked more frequently than cattle that have been in the feedlot for a longer period of time. Good pen checkers know animal behaviour and are quick to recognize a calf that is acting different. Commonly observed signs in sick calves with pneumonia are depression, poor appetite, weakness and occasionally signs of coughing and difficulty breathing. It is important to observe all the calves in a pen before trying to remove any cattle. Once the cattle are aroused and moving it is very difficult to pick out sick animals. When an animal has been selected as sick it should be taken out of the pen to a treatment area. If a calf is suspected of having an infectious disease such as pneumonia it should have a fever, if it does not have a fever it can be returned to its home pen without treatment. Animals that are sick and require treatment should be kept in a separate pen for daily observation and treatment.

Animals that are selected for treatment should be given a working diagnosis. This would be used to categorize the cattle for a particular treatment protocol. The treatment protocol should be worked out in advance with your veterinarian and describe which drug, what

dose, length of treatment and length of withdrawal. A daily record of each treatment should be kept in a log book in a small feedlot or on an individual record card for each sick animal in a larger feedlot. The record should include dates treated, temperature, drug and dose used. The rectal temperature should be taken daily to determine the response to treatment. Once the recommended treatment has been carried out and the temperature has returned to normal the animal can be returned to its home pen. The record of the treatments and the response of the cattle treated can be used to evaluate the effectiveness of the treatment protocol.

Drug residues have become an industry wide problem. Although the abuse of drugs in beef cattle is not wide spread it has become a more sensitive topic and attracts considerable press attention. Every feedlot operator must be aware of this problem and understand that reports of drug residues in beef may reduce the public's image of beef as a quality product and reduce the market for beef. It is important for feedlot operators and their crews to regularly review the withdrawal times of all drugs and implants used in the feedlot with their veterinarian. All animals treated with drugs should be identified with an individual ear tag and a record kept of the exact treatment given to that animal. All animals being shipped for slaughter can then be checked for any recent treatment. Drugs used in a feedlot should be used at the dosage and withdrawal time recommended on the package label or at the direction and supervision of a veterinarian. Careful observation of withdrawal times will prevent condemnation of carcasses for residues and help to maintain beef's image as a quality product.

Nutritional problems are more common in smaller feedlots. Grain overloads are not unusual with self feeders due to poor mixing of the feed, separation of the feed inside the feeders and problems with overeating if the feeders are emptied then filled up again after a delay.

Feeding in a bunk provides more control and monitoring of daily intake. Sick animals may be noticed early when they do not come up for feed at the bunk at feeding time. Bloats may be associated with too fine a size of feed, such as found in screenings, pelleted rations and in finely ground rations. Vitamin A deficiency can occasionally be a problem in purchased cattle but can easily be added to the ration as part of the supplement or administered by intramuscular injection. Energy deficiency is an occasional a problem in calves that are backgrounded overwinter, cold temperatures greatly increase their energy requirements and their heavy coats may hide the fact that they are very thin.

Pasteurella haemolytica is probably the most important cause of fibrinous pneumonia in cattle in the feedlot. A new vaccine is available that is probably beneficial in reducing morbidity and mortality but tests on this product have not been fully reported yet. Antibiotics in the feed, water and injected intramuscularly have been used for a long time for the control of shipping fever. The use of long acting oxytetracycline has been demonstrated to be effective but feed and water medication have not been clearly shown to be effective in controlling this problem.

There appears to be an increasing problem with diseases caused by Haemophillus somnus. This organism causes many different diseases including ITEME, pneumonia, pleuritis , lameness, and myocarditis (infection in the heart muscle). The available vaccines only seem to provide a partial protection to the disease. If it is a severe problem the addition of 1 gram of chlortetracycline / head /day in the feed has been reported to be effective in controlling the disease (this must only be added by a veterinarians prescription).

IBR vaccination is some what controversial. Studies in Ontario have indicated that vaccinating with modified live IBR vaccine may cause an increase in the number of cattle

treated. Experience in western Canadian feedlots has shown that failure to vaccinate with an effective IBR vaccine can lead to severe outbreaks of IBR. Most large western Canadian feedlots vaccinate with a modified live intramuscular IBR vaccine because this has been shown to reliable prevent outbreaks of clinical IBR.

BRSV or Bovine Respiratory Syncytial Virus vaccine has been available for several years but has yet to be shown as effective in reducing respiratory disease in the feedlot. Researchers are still uncertain as to how much of a problem it is and whether the vaccine is effective in preventing it. Clostridial vaccines are almost universally used and the only question might be whether to use a two-way or a 7 or 8-way vaccine. Other vaccines may be recommended for specific problems in your area by your veterinarian.

A good herd health program in a feedlot will involve working with your veterinarian to set up vaccination and treatment procedures. The development of good records and pen checking skills will help to provide early indications of problem groups of cattle and this should give time for appropriate intervention and treatment. Effective health management can take away some of the uncertainty of operating a feedlot.

"HOW MANY FENCES DO YOU REALLY NEED?" A LOOK AT SOME PASTURE MANAGEMENT SYSTEMS

by

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In North Dakota, rangelands comprise 12.5 million acres or 30% of the land area. Land used for grazing has steadily decreased from 1958 to 1967 and the trend is continuing. As a result of this ever-decreasing amount of grazing land in the state, greater pressure will be placed on the remaining rangeland for livestock production. Presently, most North Dakota ranchers graze native mixed-grass prairie using seasonlong grazing or a once-over deferred rotation grazing system. Application of grazing systems has the potential of promoting range improvement, increase livestock production and improve wildlife habitat in North Dakota. At the Central Grasslands Research Station (CGRS) in southcentral North Dakota studies are underway to compare seasonlong grazing and short duration, switchback and twice-over rotation grazing systems.

Study Area

The CGRS is approximately 40 miles southwest of Jamestown, ND within the Missouri Coteau. The Coteau, of glacial origin, is characterized by "hummocky," irregular, rocky plains, and many potholes and sloughs. Vegetation is typical of the mixed-grass prairie. Important graminoid species include western wheatgrass (Agropyron smithii), Kentucky bluegrass (Poa pratensis), blue grama (Bouteloua

gracilis), needle-and-thread (Stipa comata), Junegrass (Koeleria pyramidata), and threadleaf sedge (Carex filifolia). Some important forbs include white sage (Artemisia ludoviciana), fringed sage (A. figida), silver-leaf scurf pea (Psoralea argophylla), red false globemallow (Sphaeralcea coccinea), and goldenrods (Solidago spp.). Western snowberry (Symphoricarpos occidentalis) is the dominant low shrub on mesic sites originally supporting a variety of mid and tall graminoid species.

The area has a continental climate with cold winters and warm summers. January is the coldest month with an average temperature of 7°F and July is the warmest with an average temperature of 68°F. Mean annual precipitation for a 35-year period (1951-1986) was 17.9 inches, with 80% falling between April and September. Between 1982 and 1988, annual precipitation averaged 18.7 inches (Fig. 1).

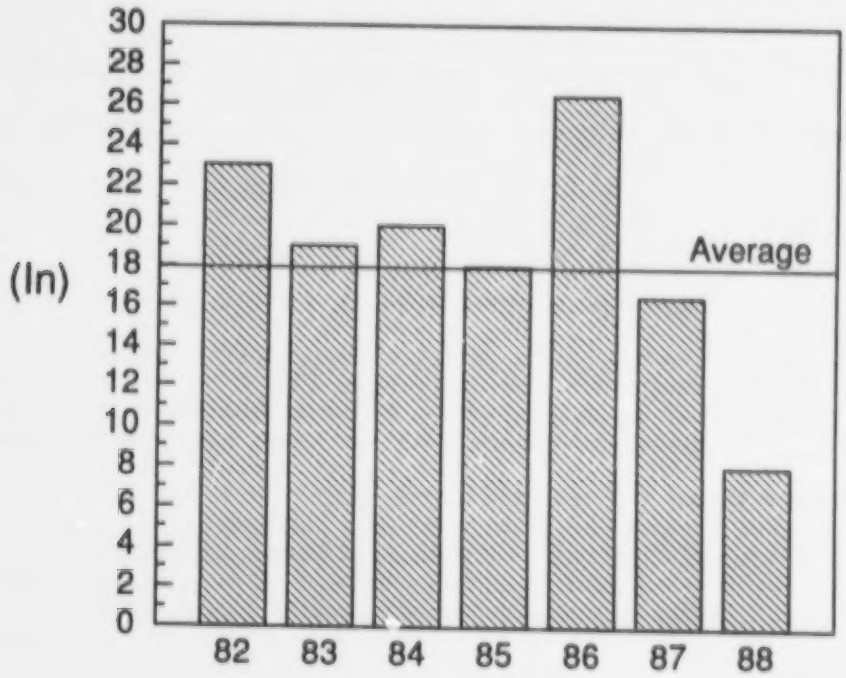

Figure 1. Annual precipitation at the CGRS.

Grazing Treatments

The grazing treatments were implemented between 1982 and 1986. Location (Fig. 2) and operational data are compared in Table 1. All treatments are grazed from late May to approximately November 1, totalling 160 days.

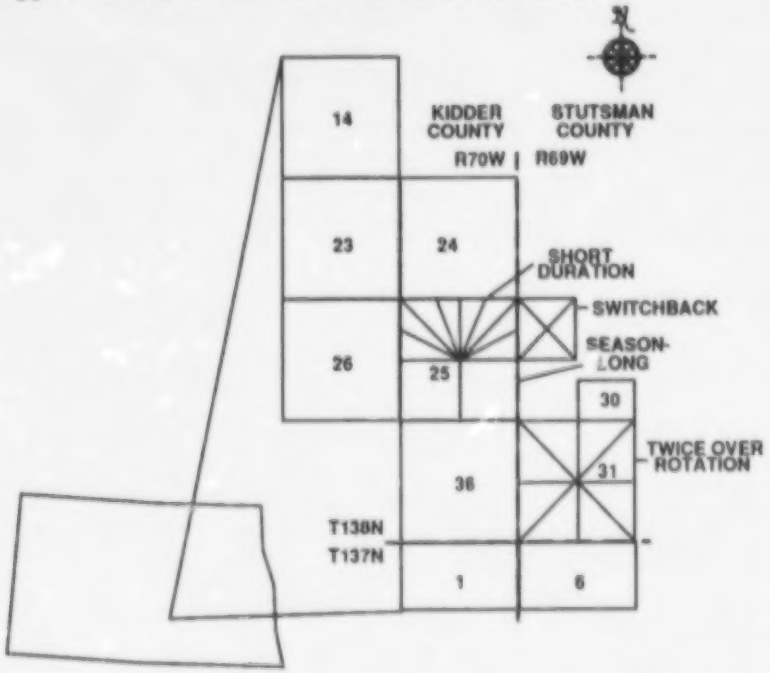

Figure 2. Grazing treatments on the CGRS.

Sampling

Silty and overflow range sites which account for 85% of the grazing area of the CGRS were selected for vegetation sampling. Portable cages were placed in each treatment and paired grazed and ungrazed (caged) plots were clipped throughout the grazing season. The initial clipping plus growth as shown by caged plots were used to estimate forage yield. Disappearance of forage from grazed plots were used to determine utilization.

Cows and calves were randomly sorted and weighed on and off pasture trials. Additional weights were taken at 84 days and every 28 days thereafter.

Table 1. Grazing treatment management.

	RSL	SWB	TOR	SDG
Initiated	1982	1986	1985	1982
Pastures	1	2	4	8
Replications	2	2	2	1
Acres/pasture	160	40	80	40
Acres/treatment	320	160	640	320
Rotation (days)	none	20	20	5
Cow-calf pairs	23	16	65	65
Stocking rate (AUM/ac)	.75	1.1	1.1	1.1

Ground Nesting Bird Surveys

All sharp-tailed grouse dancing grounds found withing a one-mile radius of the station boundaries were censused three times in the spring of each year. In 1984, 1985, and 1986, 45 sharp-tailed grouse hens were trapped, using cloverleaf traps or rocket nets, from the dancing grounds located on or nearest the grazing treatments. The radio-tagged hens were monitored with standard telemetry equipment to the nests and through the nesting period to determine nesting habitat and nest success. Other nests were located by chain dragging, in which a 100-foot ¾ inch chain was pulled behind two three-wheeled motorcyles at a low speed, in an attempt to flush birds from the nest.

Visual obstruction readings were taken along permanent transects in each of the grazing treatments and an idle area to determine habitat available for nesting. Visual obstruction readings were also taken at the nest sites to determine habitat utilization. Visual obstruction was reported in decimeters (4 inches) of vegetation height where 100 percent obstruction occurred.

RESULTS AND DISCUSSION

Grazing Treatments

Good growing conditions were evident each year until 1988 (Fig. 1). Annual precipitation exceeded the long-term average each of the first 6 years resulting in annual forage production averaging over 2000 lbs/ac on all treatments (Table 2). The range of forage production on each treatment has been quite variable (exceeding 100%) which is mainly a reflection of the timing and amount of growing season precipitation received.

Mean forage production differs between grazing treatments (Table 2). Much of this difference can be attributed to the length each treatment has been monitored. The SWB and TOR treatments have been monitored only the last 3 and 4 years of which 1986 and 1987 were peak forage producing years. If only the last 3 years are considered, the RSL, TOR, and SDG mean annual forage production would be 3007, 2649, and 2927 lbs/ac, respectively. These production values compare more favorably with the SWB treatment. Additionally, the SWB treatment had been allowed a 4 year rest from grazing while the other treatments had been grazed each year even prior to state ownership.

Forage use has averaged between 51 and 58% on the grazing treatments (Table 2). As is evident, annual forage use has been similar among treatments each year and between years until 1987 and 1988, despite a 40 to 45% greater stocking rate on the SWB, TOR and SDG treatments. In 1987 and 1988, the SDG treatment has had greater forage use. This trend will continue to be monitored.

The long-term average gain for cows ranges between 0.6 and 0.8 lbs/day on treatments (Table 3). Initially cows on the RSL treatment maintained 15 to 20 lbs more over the grazing season than rotationally grazed cows but this trend has not been evident in latter years.

Table 2. Forage yield and use (%).

Year	RSL	SWB	TOR	SDG
		lbs/ac		
1982	2453 (41)	-	-	2194 (41)
1983	2267 (67)	-	-	2202 (59)
1984	1649 (42)	-	-	1690 (55)
1985	2832 (58)	-	2592 (52)	1446 (62)
1986	3424 (59)	3813 (58)	3126 (48)	3569 (52)
1987	4059 (51)	4053 (53)	3439 (50)	3871 (64)
1988	1538 (47)	2035 (54)	1382 (55)	1342 (75)
Mean	2603 (52)	3300 (55)	2635 (51)	2332 (58)

Table 3. Cow and calf performance.

	RSL	SWB	TOR	SDG
		lbs		
Cow ADG	0.7	0.6	0.8	0.7
range	0.4 - 1.1	0.4 - 1.1	0.2 - 1.2	0.3 - 1.0
Calf ADG	2.1	2.3	2.3	2.0
range	1.6 - 2.4	2.1 - 2.5	2.2 - 2.4	1.6 - 2.3
Calf G/ac	37	56	58	52
range	21 - 47	48 - 70	46 - 67	31 - 63

Calf average gains range between 2.0 and 2.3 lbs/day for the grazing treatments (Table 3). In the first 3 years of the RSL and SDG treatments, cow and calf numbers were limited so little selection was possible. Since this time a strong culling program has been implemented and calf gains have improved. If only the last 4 years are compared, calf gains on both the RSL and SDG treatments would average 2.2 lbs/day which compares favorably with the SWB and TOR treatments.

Calf production per acre is a reflection of average daily gain and stocking rate. Again, if only the last 4 years are compared, rotational grazing increased calf production per acre 41% (57 vs 40.5 lbs) (Table 3). Comparing only the last 4 years, the rotational grazing treatments SWB, TOR, and SDG, have produced 56, 58, and 57 lbs of calf per acre.

Ground Nesting Birds

Sharp-tailed grouse male populations, estimated from dancing ground censuses on or within 1 mile of the CGRS ranged from 119 to 187 between 1983 and 1988. Increases in populations occurred in 1987 (23%) and 1988 (28%) from a low of 119 to 1986.

Over 95% of sharp-tail nests found in the grazed treatments were initiated either before cattle were moved to the pastures or in pastures where grazing was deferred in the spring. Apparent nests/100 ac was highest on the TOR grazing treatment and non-grazed areas although apparent success of these nests were the lowest among the treatments (Table 4). Mayfield adjusted nests/100 ac was again highest on the TOR treatment and non-grazed areas. However, Mayfield adjusted successful nests/100 ac indicated slightly higher grouse production from non-grazed areas.

Table 4. Sharp-tailed grouse nesting results, 1984-1986.

	RSL	TOR	SDG	IDLE	TOTAL GRAZED	OTHER
Apparent nests/100 ac	0.4	0.8	0.4	1.0	0.5	0.5
Apparent success (%)	75	50	75	38	60	63
Adjusted success (%)[1]	65	26	72	26	42	48
Adjusted nests/100 ac[1]	1.4	4.3	1.3	5.2	2.3	2.1
Adjusted successful[1] nests/100 ac	.9	1.1	.9	1.4	1.0	1.0

[1]Adjusted using Mayfield's method.

Ducks also initiated the majority of their nests prior to the grazing season. Of all nests located in 1987 and 1988, approximately 70% were initiated prior to the grazing season. An additional 16% were initiated in pastures that had not been previously grazed that season, while 10% were initiated while cattle were present.

Duck nesting was similar between grazed treatments and non-grazed areas (Table 5). Nesting success, however, was lower on non-grazed areas. Of the grazed treatments, adjusted nesting success was greatest on the TOR grazing system.

Table 5. Waterfowl nesting results, 1987-1988

	RSL	TOR	SDG	IDLE	TOTAL GRAZED	OTHER
Total nests	116	221	135	88	472	93
Nests/100 ac	18	17	21	21	19	14
Apparent success (%)	50	60	47	28	52	30
Adjusted success (%)[1]	28	42	24	12	33	15

[1]Adjusted using Mayfield's method.

Nineteen vegetative species occurred at sharp-tailed grouse nests. Kentucky bluegrass and western snowberry were the most frequently encountered species occurring at 84 and 63% of all nests, respectively. More species were identified at nests in non-grazed areas than in grazed pastures.

Sharp-tailed grouse nest VOR's were greatest at the nest and decreased in all directions away from the nest on grazed treatments, but not in non-grazed areas. Nest VOR's were higher than average pasture VOR's (Table 6), indicating grouse were very selective in nest selection. Over 80% of grazed pasture VOR's were 4" or less while only 11% of nest VOR's were 4" or less. Half of the nest VOR's exceeded 6" cover despite only 6% and 32% of grazed and non-grazed VOR's greater than 6".

Table 6. Sharp-tailed grouse visual obstruction readings, 1984-1986.

	RSL	TOR	SDG	IDLE	TOTAL GRAZED	OTHER
Nests (Inches)	7.6	6.8	9.6	6.8	7.2	7.2
Pasture (%)						NEST
0-2"	30	39	37	7	35	0
2-4"	50	43	45	28	46	11
4-6"	13	13	13	33	13	29
6-8"	5	3	3	14	4	14
8-10"	1	1	1	6	1	29
>10"	1	1	1	12	1	17

SUMMARY

I. Grazing Treatments

A. Stocking rates using rotational grazing systems have increased over seasonlong grazing.

B. Forage yield has been maintained at higher stocking rates under rotational grazing.

Forage use has been similar between rotational and seasonlong grazing with the exception of the SDG treatment in 1987 and 1988.

C. Livestock performance is similar among treatments and calf production is increased under the higher stocking rates of the rotational grazing treatments.

II. Ground Nesting Birds

A. Dense residual cover in spring is vital to nest selection by sharp-tailed grouse and waterfowl.

B. Delay the grazing season until late May or early June. This would allow nest initiation prior to grazing.

C. Rotation grazing systems prolong the spring grazing deferment on a percentage of the system which increases nest initiation and improves nesting cover for ground nesting birds.

BEEF NUTRITION USING TRADITIONAL AND ALTERNATIVE FEED SUPPLIES

Presented at Manitoba Beef Cattle Seminar, Brandon, MB on January 18, 1989.

- Bill Steeds, Provincial Animal Nutritionist, Manitoba Agriculture

"Beef Nutrition Using Traditional and Alternate Feed Supplies" or, in more simple terms, how do we use the feeds available this year to get proper production at least cost, or getting most 'bang for our buck.'

1988 has been an extremely interesting year from a feeding standpoint. Early in the growing season, with the drought in the southern part of the province, the primary concern was for adequate forage supplies of any type. As the season progressed and at least some rain fell in most of the drought affected areas, it became apparent that although feeding value may be questionable, forage supplies of some type would be adequate in most areas. Ultimately, forage supplies turned out to be not only adequate in most areas, but of uncommon high quality.

During this year we have seen the price of good quality legume or grass legume hay go from $15-$20/tonne to $80-$100/tonne. While the grain yield was much below normal, the bushel weights (energy values) tended to stay about normal while the levels of protein turned out to be higher than normal. Over the same period, we have seen the price of barley go from $0.90/bushel to about $2.80/bushel. We do not have cheap feed this winter, but because of the uncommonly high feeding value of many forages and grains, there are opportunities to not only achieve good production but also make significant savings by sharp feeding management. Let us have a close look at specific feedstuffs and the factors which should be considered when incorporating these feeds into a feeding program.

Probably the first major consideration should be the safety of any particular feed from an animal health standpoint.

One major effect of this year's drought is that high nitrate levels in forages have become a significant factor. High nitrate levels in feeds do not have to be a problem provided the feeds are managed accordingly. First of all, the nitrate level in the feed must be known. Each Agriculture Representative office is equipped with a nitrate testing kit which will detect the presence or absence of nitrates in forages. As with all other forms of feed testing, it is obviously important that the producer provide a representative sample. A grab sample from a bale or two is not enough. The nitrate level can vary greatly in areas within a field depending on crop stage of maturity, etc. so a grab sample could give a result which is not at all representative of the total field. This could either result in a producer going to a lot of needless trouble in his feeding program if the nitrates were overestimated, or animal deaths if the nitrate level was underestimated. Either is an unnecessary waste of time and money.

The proper way to sample feed is to obtain the forage sampling probe from the Ag. office and take at least 15 probes from bales from various parts of the stack. Mix all these in a clean pail and take a sample of this for testing. If nitrates are detected in the spot test at the Ag. office, forward the sample to the Provincial Feed Testing Laboratory for determination of the specific levels of nitrates in that particular feed. Table #1 shows the results of the nitrate analyses done at the Provincial Laboratory during 1988.

During normal growth, nitrates are drawn up through the roots into the plant, move into the leaves, and in the presence of light and moderate temperatures, nitrates are converted within the leaves to plant protein. Where conditions such as frost or drought interfere with normal leaf function, nitrates accumulate in the plant. When eaten by the ruminant animal, nitrates are broken down by rumen microflora into nitrates, and then into ammonia. Problems arise when nitrates are broken down into nitrites faster than nitrites are converted to ammonia, and there is a buildup of nitrites. Nitrites in

the blood decrease the ability of the blood to carry oxygen, and the effect is that, where high levels of nitrates are consumed, the animal, if left untreated, dies of suffocation in 4-6 hours. If the cow recovers, often the calf will be aborted.

Determining specific levels of nitrates in forage is no problem. The big problem is determining levels of nitrates which will cause stress to the animal. This is a problem because the effects of nitrates on the animal vary greatly with management. Nitrate tolerances have been determined by dosing with progressively larger amounts of nitrates until the animal shows effects. By this method, it has been determined that 0.5% of the ration dry matter, as potassium nitrate, is an upper safe limit in virtually all animals, and this is the safe level suggested in Manitoba, as a general recommendation. However, animals do not generally eat the total daily feed intake, and, therefore, nitrate intake, in a short period, but over much of the 24 hours. This greatly reduces the amount of nitrates the bacteria has to convert to ammonia at any one time. As well, rumen microbial numbers significantly affect the amount of nitrates which can be effectively processed. Therefore, a well-fed animal with a healthy population of rumen microbes will be able to handle more nitrates than an animal on a poor plane of nutrition. In addition, rumen microbes have the ability to adapt to higher levels of nitrates in the diet, if adapted over a period of several weeks.

Feed high in nitrates can be fed, if diluted to a safe level of nitrates with feed containing little or no nitrates. The important consideration is to dilute the feed in such a way that the animal does not receive a significant amount of high nitrate feed in any short period. The mechanics of this may not be easy when large round bales are being fed, but under conditions of forage shortage, the effort should be worthwhile. Despite the above, animal losses due to nitrates have and will continue to be recorded this winter.

Prussic acid poisoning may also cause animal losses this year. While having the same oxygen limiting effects on the blood as nitrates, losses occur from prussic acid in as little as fifteen minutes. Prussic acid is only a problem in two cultivated crops - flax and sorghum sudan grass.

Because of the forage shortage in some areas of the province, producers attempting to salvage any potential feed source have put up feed from fields containing flax. The feed lab has examined a number of these feeds and a substantial number have proven to be over the safe level of 0.02% of dry matter. Prussic acid poisoning is basically the same as cyanide poisoning. Death can occur rapidly and the toxic level is very low. Although, theoretically, feeds containing high levels of prussic acid could be blended down to safe levels, the margin of error is so small that we recommend that these feeds not be used. While nitrates accumulate only in the stem and leaves, prussic acid can be a problem in the seeds of green flax.

Sorghum sudan is high in prussic when it is small, with concentrations decreasing as the plant grows until by the time plants reach 18-24 inches in height, they are usually safe for feeding. Because of this growth pattern, pasturing sorghum sudan regrowth is not recommended.

Once the actual safety of the forage for feeding has been determined, how is a feeding program developed around the forage supplies on hand?

The basics of nutrition need not be complicated - in fact, are relatively simple. There are only five basic nutrients required, whether feeding canaries or cows. These are:

ENERGY
PROTEIN
MINERALS
VITAMINS
WATER *

An asterisk is beside water because water is by far the most important nutrient in the short term. Cows need a supply of good, fresh, clean water, free choice, or at least all they can drink, twice a day. Snow is not a satisfactory substitute for water.

Moving up the list, vitamins are important but easy to supply. Vitamins A and D are of prime importance to cows. Cows require 30,000 I.U. of vitamin A/head/day during gestation and 50,000 I.U./head/day during lactation until out on good pasture. Since vitamin A is stored in body fat, it can be supplied at intervals and retreived from the fat as required. It can be fed on a daily basis, once a week, or once a month if the proper amounts are fed. Vitamin A can be injected once every 60 days. A water soluble vitamin can be used if desired. Vitamin A costs only ½¢/day and you cannot afford not to provide it. Cows exposed to sunlight will have no further vitamin D requirement, as vitamin D is manufactured in the body in the presence of sunlight.

This leaves energy, protein and minerals to be provided.

Beef cows will do quite well on from 2 to 7 parts of calcium to each part of phosphorus in the diet. There should never be more phosphorus than calcium in the diet. Grass forages contain 2-3 times more calcium than phosphorus, while legumes contain 5-10 times more calcium than phosphorus. Straw contains very low quantities of both, while cereal grains contain four times as much phosphorus as calcium.

Beef cows will require one of two basic mineral supplements - either a mineral containing equal parts of calcium and phosphorus (1:1 mineral) or a mineral containing 2-3 times as much calcium as phosphorus. Read the tag. Don't buy on price alone. Calcium is cheap and phosphorus expensive. Demand a mineral high in trace minerals. The more trace mineral work we do in Manitoba, the more we discover the need for trace minerals in all parts of the province. 'Normal' minerals will contain

200-300 ppm of copper, while minerals high in trace minerals will contain copper in the 2500-4000 ppm range.

If you are feeding a ration made up of grass or grass-legume forage, plus a few pounds of grain, you need the 1:1 mineral. If you are feeding a ration made up of straw or low quality forage, plus grain, buy the mineral high in calcium. During lactation feed 2-3 oz./head/day. Adequate phosphorus is very important for proper reproduction, so it is especially important to provide adequate minerals from calving until the cow is safely bred. Minerals cost about 1.5¢/oz. of mineral supplement. They are of major importance and of minor cost. Provide salt and your mineral requirements are met.

Energy and protein have yet to be provided.

Energy is the fuel the body runs on, and is by far the largest requirement in terms of quantity. When feed is bought, what you are buying is basically a source of energy. Although protein is more expensive than energy per unit, relatively speaking, only a small amount of protein is required compared to energy. For example, to put this in perspective, during lactation a beef cow will require 15-16 pounds of energy and only 2.5-3.0 pounds of protein.

Energy is expressed as TDN (total digestible nutrients). When a feed contains 50% TDN, it means that for every 100 pounds of feed, there are 50 pounds of actual TDN. Sometimes energy is expressed as DE (digestible energy). This means the same thing as TDN and the two are interchangeable, with 1 pound of TDN being equivalent to 2000 Mcal of DE, or 1kg of TDN equal to 4.4 Mcal of DE. Average energy values for common feeds are given in Table #2. Grains are high in energy when compared to forages.

Energy should be bought on the basis of cost per pound or kg - actual TDN. For example, 48 pound barley contains 83% TDN on a dry matter basis and sells for $30/tonne. Average dry matter of air dry feeds is 88 percent. Figure as follows:

1 tonne = 1000 kg

kg of actual dry matter = $\frac{88}{100}$ x 1000 = 880 kg

kg of actual TDN at 83% TDN = $\frac{83}{100}$ x 880 = 730 kg

Baley costs $130/tonne

Cost/kg of actual TDN = $\frac{\$130}{730}$ x 100 = 17.8¢/kg (kg actual TDN)

Oats contain 76% TDN on a DM basis and sell for $160/tonne.

1 tonne = 1000 kg

kg actual DM = 0.88 x 1000 = 880 kg

kg of TDN at 76% TDN = 0.76 x 880 = 669 kg

Oats cost $160/tonne

Cost/kg actual TDN = $\frac{\$160}{669}$ x 100 = 23.9¢/kg

In developing rations, the proper combination of forages and grain are figured to provide for adequate energy. Then, protein is added if necessary.

Protein is the substance which makes up most of the soft tissues of the body, such as muscles and internal organs. For this reason, protein requirements are highest in young animals which are growing rapidly.

Mature cows which are basically just maintaining themselves have a very low protein requirement. While need for protein increases during the last two months of gestation, when 70% of the growth of the fetus occurs, and increases further to provide for milk production. In ruminants, protein quality is not important because protein quality is improved by the 'bugs' in the rumen. Therefore, protein supplements for cows should be bought in the same way as energy - on a cost per unit of protein basis. Figure as follows:

44% SBM contains 44% protein on an 'as fed' basis and sells for $375/tonne.

1 tonne = 1000 kg

kg of actual protein - 0.44 x 1000 = 440 kg

Cost/tonne - $375

Cost/kg of actual protein = $\frac{\$375}{440}$ x 100 = 85.2¢/kg

35% canola meal contains 35% protein on an 'as fed' basis and sells for $248/tonne.

1 tonne = 1000 kg

kg of actual protein/tonne = 0.35 x 1000 = 350

Cost/tonne = $248

Cost/kg of actual protein = $\frac{\$248}{350}$ x 100 = 70.9¢/kg

Comparisons of cost per kg of actual protein from various sources are in Table #3. It must be remembered that the commercially prepared mixes also contain vitamins and minerals, as well as protein and this has to be taken into account, in assessing value. The figures in Table #3 only take into account actual protein.

Table #4 compares, in pounds, the amounts of energy and protein actually purchased for $1.00. Again, it must be recognized that the commercially prepared products contain vitamins and minerals, in addition to protein and energy. Vitamins and minerals are absolutely necessary and must be provided. * <u>It cannot be stressed enough that it is not good enough to opt for a cheaper source of protein or energy than a commercially prepared product unless you go to the trouble of adequately supplementing and balancing the ration with minerals and vitamins. All nutrients have to be provided in proper amounts in order for the animal to use the ration for efficient production and growth.</u>

However, with that in mind, a look at average analyses of feeds grown this year (Table #5) does suggest some interesting possibilities for financial gains for anyone interested in going to the trouble of using supplements to make up specific nutrient deficiencies in cow rations.

First of all, Table #5 gives average analyses of feeds this year, and in order to take advantage of improvements in feed quality, which may or may not be present on your farm, your feed has to be tested for its nutrient content. Using average values will not suffice. However, the average values for 1988 feeds do show interesting trends. In most years, cereal straws can be expected to contain about 4% crude protein and 40-45% TDN on a dry matter basis, depending on the type of straw and how it was handled. This year oat and barley straws we have analyzed have been found to average 6.5-7.5% protein and 52% TDN on a dry matter basis. This is enough protein and energy to satisfy requirements for mature cows in good condition during early gestation. In fact, this straw contains the protein and energy commonly found in native hays many years.

It can be speculated that the improvement in quality of straw can be attributed to the general lack of effectiveness of weed control measures this particular year, although this may not be the whole story. Wheat straw analysed this year at 4.1% protein, but contains 48% TDN as opposed to a 'normal' TDN for wheat straw of about 40%. Depending on individual analysis, these figures indicate the possibility for real savings in energy and protein supplementation in specific cases.

Alfalfa forages are of exceptionally high quality this year to the extent that a major problem for many dairy producers will be a low butterfat test due to a lack of fiber in the diet. Crude fiber levels in the 16% range are being found in some samples of this year's alfalfa hay.

Cereal grains, in a drought year, would be expected to contain higher than normal levels of protein, and this has proven to be the case. This is especially notable for wheat, which on

the basis of the samples we have analysed contains an average of 18% protein. Barley and oats contain an average of 12.8 and 13.6% protein, respectively. This will have a very real effect on the amount of protein supplement required in some rations.

Screenings as an energy source may or may not be a good investment depending on the makeup of the screenings and the cost/tonne. Normal refuse screenings which have gone through the Provincial Feed Testing Lab over the years contain, on a dry matter basis, 67-70% TDN and at least 12% protein. These screenings contain about the same level of energy as good corn silage. These screenings can be used to extend feed supplies for animals which are not at high levels of production. For example, they can be useful in cow rations at up to 10-12 pounds/day. With straw at 45% TDN and screenings at 67% TDN, a mix of half straw and half screenings would provide 56% TDN and 8% protein. This would be fine during gestation but would require either better quality roughage or higher energy cereal grains during lactation. For younger animals, these screenings, plus low quality roughage simply do not provide enough energy for normal gains in the 1.5-2.0 pound/day range.

Value of screenings as an energy source depends on the cost/pound of TDN as with any other feed. Screenings at 68% TDN on a dry matter basis and selling at $83.00/tonne would supply TDN at 14¢/kg, while the same screenings at $120.00/tonne would provide TDN at 20.5¢/kg. With TDN from $130 barley costing 17.8¢/kg, one screening would be a good buy and one would not. One of the major problems with screenings is the large variability in quality, and each batch should be tested, and bought and used on its own merits.

Another interesting result of the drought is the use of weeds as forage. A case in point with a happy ending for many producers is the use of the weed kochia for forage. It contains,

on a dry matter basis, approximately 18% protein, 60-65% TDN, is very palatable, can be ensiled, and is recommended for use at up to half the daily dry matter intake for wintering cows.

The drought of 1988 has definitely resulted in feeding problems for producers in some areas of the province. However, because of the unusually high quality of some feeds, good feeding management this year provides the potential for significant savings in feed costs, while maintaining satisfactory performance.

TABLE #1

LEVEL OF POTASSIUM NITRATE IN FORAGES
PROVINCIAL FEED ANALYSIS LAB.

JULY - OCTOBER 18, 1988

FORAGE TYPE	TOTAL # SAMPLES	% OF TOTAL						
		NEGATIVE	0.5	0.5-1.0	1.0-1.5	1.5-2.0	2.0	3.0
Oats	150	17.3	38.7	26.0	8.7	8.0	0.7	0.7
Barley	45	20.0	40.0	17.8	13.3	8.9	-	-
Wheat	70	34.3	45.7	11.4	5.7	2.9	-	-
Unidentified Greenfeed	76	25.0	39.5	18.4	10.5	6.6	-	-
Millet	106	26.4	34.0	21.7	9.4	5.7	1.9	0.9
Sorghum Sudan	39	15.4	41.0	17.9	7.7	12.8	5.1	-
Oat Straw	18	16.7	38.9	16.7	-	27.8	-	-
Barley Straw	2	50.0	50.0	-	-	-	-	-
Wheat Straw	2	100.0	-	-	-	-	-	-
Unidentified Straw	4	-	50.0	50.0	-	-	-	-
Millet Straw	2	100.0	-	-	-	-	-	-
Millet Stubble	1	-	-	-	100.0	-	-	-
Whole Plant Canola	4	-	25.0	50.0	25.0	-	-	-
Clover	3	33.3	66.7	-	-	-	-	-
Alfalfa Brome	8	87.5	12.5	-	-	-	-	-
Corn	7	57.1	-	28.6	14.3	-	-	-
Kochia	3	-	-	33.3	-	-	66.7	-
Buckwheat	1	-	-	100.0	-	-	-	-
Flax	5	20.0	40.0	20.0	-	-	20.0	-

TABLE #2

AVERAGE ENERGY VALUES FOR COMMON FEEDSTUFFS

100% DRY MATTER BASIS

	% TDM
GRAINS	
CORN & WHEAT	88
BARLEY	83
OATS	76
REFUSE SCREENINGS	65-70
FORAGES	
GREENFEED-EARLY DOUGH	60-65
ALFALFA	60-65
CORN SILAGE	55-65
GRASS-LEGUME	55-60
NATIVE HAY	50-53
CANOLA-FROZEN	55
OAT-BARLEY STRAW	45
WHEAT-RYE STRAW	40
LEGUME STRAW	45-50
GRASS STRAW	45

THE ABOVE WOULD BE CONSIDERED AVERAGE VALUES FOR MANITOBA FOR MOST AREAS

TABLE #1

LEVEL OF POTASSIUM NITRATE IN FORAGES
PROVINCIAL FEED ANALYSIS LAB.

JULY - OCTOBER 18, 1988

FORAGE TYPE	TOTAL # SAMPLES	% OF TOTAL						
		NEGATIVE	0.5	0.5-1.0	1.0-1.5	1.5-2.0	2.0	3.0
Oats	150	17.3	38.7	26.0	8.7	8.0	0.7	0.7
Barley	45	20.0	40.0	17.8	13.3	8.9	-	-
Wheat	70	34.3	45.7	11.4	5.7	2.9	-	-
Unidentified Greenfeed	76	25.0	39.5	18.4	10.5	6.6	-	-
Milliet	106	26.4	34.0	21.7	9.4	5.7	1.9	0.9
Sorghum Sudan	39	15.4	41.0	17.9	7.7	12.8	5.1	-
Oat Straw	18	16.7	38.9	16.7	-	27.8	-	-
Barley Straw	2	50.0	50.0	-	-	-	-	-
Wheat Straw	2	100.0	-	-	-	-	-	-
Unidentified Straw	4	-	50.0	50.0	-	-	-	-
Millet Straw	2	100.0	-	-	-	-	-	-
Millet Stubble	1	-	-	-	100.0	-	-	-
Whole Plant Canola	4	-	25.0	50.0	25.0	-	-	-
Clover	3	33.3	66.7	-	-	-	-	-
Alfalfa Brome	8	87.5	12.5	-	-	-	-	-
Corn	7	57.1	-	28.6	14.3	-	-	-
Kochia	3	-	-	33.3	-	-	66.7	-
Buckwheat	1	-	-	100.0	-	-	-	-
Flax	5	20.0	40.0	20.0	-	-	20.0	-

TABLE #2

AVERAGE ENERGY VALUES FOR COMMON FEEDSTUFFS
100% DRY MATTER BASIS

	% TDM
GRAINS	
CORN & WHEAT	88
BARLEY	83
OATS	76
REFUSE SCREENINGS	65-70
FORAGES	
GREENFEED-EARLY DOUGH	60-65
ALFALFA	60-65
CORN SILAGE	55-65
GRASS-LEGUME	55-60
NATIVE HAY	50-53
CANOLA-FROZEN	55
OAT-BARLEY STRAW	45
WHEAT-RYE STRAW	40
LEGUME STRAW	45-50
GRASS STRAW	45

THE ABOVE WOULD BE CONSIDERED AVERAGE VALUES FOR MANITOBA FOR MOST AREAS

TABLE #3

COST/KG OF ACTUAL PROTEIN FROM VARIOUS SOURCES

100% DRY MATTER BASIS

PRODUCT	$/TONNE	¢/KG PRODUCT	¢/KG PROTEIN
44% SOYBEAN MEAL	375	37.5	85.2
35% CANOLA MEAL	248	24.8	70.9
11% BARLEY	130	13.0	118.2
25% N-R-G BLOCK (112 kg)	45/BLOCK	40.2	160.8
32% LIQUID SUPPLEMENT	260	26.0	81.3
32% PELLETS	250	25.0	78.1
18% ALFALFA	100	10.0	55.6

* PRICES AS OF SEPT. 20/1988

ASSUMPTIONS:

25% N-R-G BLOCK - TDN - 65% ON A DRY MATTER BASIS
ACTUAL DRY MATTER OF BLOCK = 75%

32% LIQUID SUPPLEMENT - 13 LB/GALLON
- 65% TDN ON DM BASIS
- ACTUAL DM OF BLOCK = 65%

TABLE #4

POUNDS OF PROTEIN AND TDN PURCHASED FOR $1.00

PRODUCT	$/TONNE	¢/LB.	LB. PROTEIN/$	LB. TDN/$
44% SOYBEAN MEAL	375	17.0	2.6	4.3
35% CANOLA MEAL	248	11.2	3.1	5.8
11% BARLEY	130	5.9	1.9	12.3
25% BLOCK (112 kg)	45/ block	18.3	1.4	2.8
32% LIQUID SUPPLEMENT	260	11.8	2.7	3.6
32% PELLETS	250	11.3	2.8	6.2
18% ALFALFA	100	4.5	4.0	12.2

* PRICES AS OF SEPTEMBER 20, 1988

PERCENT TDN ON AN 'AS FED' BASIS:		ON DM BASIS
SOYBEAN MEAL	73	83
CANOLA	65	74
BARLEY	73	83
ALFALFA	55	63
25% BLOCK	50	65
32% LIQUID SUPP	42	65
32% PELLETS	70	80

TABLE #5

ANALYSIS OF FEEDS

PROVINCIAL FEED ANALYSIS LAB.

July - October, 1988

(100% DRY MATTER BASIS)

FEEDSTUFF	TOTAL # SAMPLES	AVE. CRUDE PROTEIN	AVE. TDN	BUSHEL W.
Barley	64	12.8		49 (26 samples)
Wheat ..Grain	19	18.0		
Oats	16	13.6		36 (7 samples)
Alfalfa	268	19.6	64.3	
Alfalfa Grass	57	15.4	60.9	
Corn Silage	28	8.8	65.9	
Clover	10	13.8	59.2	
Greenfeed				
Oats	27	12.3	63.0	
Barley	19	13.3	62.7	
Wheat	23	13.9	61.2	
General	43	13.7	61.8	
	112	13.3	62.1	
Canola Straw	1	3.1	38.0	
Barley Straw	9	7.4	52.4	
Oat Straw	4	6.5	51.8	
Wheat Straw	5	4.1	48.2	
Pea Straw	4	7.2	51.5	
Timothy Straw	2	9.3	56.5	
Quack Grass	4	10.5	57.8	
Slough Hay	11	9.4	55.3	
Whole Plant Canola	6	16.5	61.0	
Millet Hay	16	13.0	62.7	
Rye Hay	1	6.7	55.0	
Red Clover	7	11.8	56.7	
Native Hay	22	9.0	55.9	
Whole Plant Field Peas	7	15.6	60.9	
Timothy Hay	4	10.4	56.5	
Sorghum Hay	6	13.3	62.5	
Reed Canary Grass	3	12.5	58.7	
Whole Plant Fababeans	1	14.0	53.0	
Brome Hay	4	9.8	57.3	
Forage Lentils	2	15.6	64.0	
Kochia	1	18.4		
Screening Pellets	8	16.9	67.8	